

Boycotts and (Self-)Regulation in a Dynamic Game

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Abstract

This paper studies the interaction between public and private politics in a dynamic framework. We present a game between a government, a firm, and a group of consumers or activists. The government considers to regulate the firm (to force it to take into account externalities, for example), but such regulation requires administrative costs that can be saved if the firm instead accepts to "self-regulate." Without any type of regulation, the activists might try forcing the firm to self-regulate by initiating a costly boycott.

The equilibrium consists of three phases. First, the activists wait and hope that the government regulates or the firm self-regulates. With some chance, however, the activists start the boycott. During the boycott, the activists are again hoping for regulation or self-regulation, while the firm is waiting since it anticipates that, with some chance, the activists give up by ending the costly boycott. If that happens, we enter the third phase of the game where the only active players are the firm and the government.

Each phase is characterized by an equilibrium in mixed strategies. The comparative static is illuminating: If regulation is important to the activists, it is less likely to occur. If regulation is costly to the firm, then a boycott is more likely to start and it tends to last longer. If the government is likely to impose regulation, then a boycott is less likely to start and, if it starts, it tends to be short-lasting. The firm, in this situation, self-regulates with a larger probability. We thus conclude that public politics can be a strategic substitute for private politics such as boycotts, but a strategic complement to private politics such as self-regulation.

Keywords: Special interest politics, private politics, boycotts, activism, regulation, self-regulation, corporate social responsibility (CSR), war of attrition.

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1 Introduction

Boycott: Withdrawal from social or commercial interaction or cooperation with a group, nation, person, etc., intended as a protest or punishment. (Oxford English Dictionary)

On November 2, 2010, the San Francisco Board of Supervisors supported, with 8-3 vote, a ban on McDonald's Happy Meal. According to the act, no company could give away a free toy with a meal with nutritional value exceeding a certain limit. The Board subsequently overturned the veto of Mayor Gavin Newsom, thereby leaving McDonald's with a list of choices: pull out Happy Meals from the menu, cut the portion, or remove the toy.

Lobbying by special interest groups is hardly atypical in a democratic system, both on the federal and local levels, and a large body of research has focused on these issues (Grossman and Helpman, 2002). Yet cases like McDonald's stand out, as legislative decisions are hardly the most common way that activist and special interest groups use to fight large corporations with brand names worth billions. Very often, activist groups use private, as opposed to public, political channels, which include pressuring the company to adopt certain practices under the threat of organized boycotts. Notable cases include the boycott of CitiCorp for its financing of non-sustainable mining and logging companies. The boycott was organized by the Rainforest Action Network (RAN), a relatively small activist group. After years of boycotts, RAN was ready to give up and end its boycott when in 2005, surprisingly, CitiCorp decided to concede and give in to the demands of RAN.

Another famous example is Greenpeace's 1995 boycott of Shell for its plans to sink Brent Spar, a used offshore oil storage facility. After weeks of intense boycotting, Shell finally decided to give in to Greenpeace's demands and dismantle Brent Spar on land. Shell then issued the following statement: "Shell's position as a major European enterprise has become untenable. The Spar had gained a symbolic significance out of all proportion to its environmental impact. In consequence, Shell companies were faced with increasingly intense public criticism, mostly in Continental northern Europe. Many politicians and ministers were openly hostile and several called for consumer boycotts."

Yet in San Francisco, health groups did not attempt to boycott McDonalds for selling Happy Meals, and relied on the legislature instead. This raises the broad question: When and why organizations wanting companies to change practices will do so through public politics (acts by the government), and when they would use private politics (boycotts or threats of boycotts)

instead. This paper, to the best of our knowledge, is the first attempt to study the question from a formal theoretical point of view.

More precisely, we study the interaction between private and public politics in a dynamic framework. The term “private politics” was coined by David Baron (see, for example, Baron, 2011) to describe non-market interactions between individuals, NGOs, and companies. Such interactions, for example, the activist’s call for boycotts, are rarely based on contracts, need not be mutually beneficial, and they often happen against the will of one of the parties involved. Nevertheless, these interactions are hardly random or irrational and, in our view, they can and should be included in political economic analysis.

In this paper, we address several questions related to boycotts and (self-)regulation in a unified framework. Why would ever a firm accept costly “self-regulation” and invest in corporate social responsibility (CSR)? If boycotts are costly to initiate and maintain for the NGO, how can they be credible, or even long-lasting? What determines the likelihood and duration of a boycott? What determines whether the firm is willing to self-regulate? How do all these answers change if a governmental agency might step in and force regulation upon the firm?

To answer these questions, we analyze a dynamic game in continuous time between a firm and an activist group (“the activist”). The firm produces and sells a good, but does so in a way that the activist believes to be wrong or harmful. The firm is aware of the activist’s concern, and may decide to adjust its practice (“self-regulate”) at any moment. While such regulation would satisfy the activist, it is costly to the firm. As long as there is no regulation in place, the activist may decide to initiate a boycott. The boycott is costly for the activist as well as for the firm. The boycott ends if the firm decides to self-regulate, or if the activist gives up.

As a third player in the game, the government may step in at any point in time and directly regulate the firm. Such regulations will naturally be even less desirable for the firm than self-regulation (the government may be unable to write the legislation in a cost-effective way, for example). Nevertheless, the government may intervene if it finds the boycott costly or self-regulation unlikely, if it is lobbied by the activist, or if it panders to the public when facing an upcoming election. We find it instructive, however, to introduce the government in two steps, and we start by simply assuming that the government steps in to regulate the firm at some exogenously given rate. Note that the game ends only after self-regulation or if regulation is imposed by the government.

The game features three phases, in which different strategies may be played. Before a boycott is initiated, the activist waits and hopes that the firm starts self-regulating or that the government decides to regulate the firm. The activist is willing to wait because the firm does, indeed, self-regulate with some probability, since the firm hopes that this will prevent a future boycott. The unique Markov perfect equilibrium (MPE) is in mixed strategies: Given the likelihood of a boycott, the firm is indifferent and it self-regulates with a positive probability. Taking this probability as given, the activist is indifferent when to initiate a boycott, and a boycott is initiated with some chance. If the boycott has started, we enter the second phase of the game. The equilibrium in this subgame takes the form of a war-of-attrition between the activist and the firm: the boycott is costly for the firm as well as the activist, and while the activist hopes the firm starts to self-regulate, the firm hopes the activist gives in and ends its boycott. If the activist does, indeed, end the boycott, then the firm finds it optimal to not self-regulate, although, at some rate, the government may still impose regulation.

The comparative static of the model is interesting: If regulation is very beneficial to the activist, then self-regulation is less likely to occur. If regulation is very costly to the firm, the boycott is more likely to start, and it lasts longer. Suppose the regulator is aggressive (in that it regulates with a large probability). Then, we show that the boycott is less likely to start and, if it does start, it ends sooner. In other words, public politics is a strategic substitute to the boycott in our model. At the same time, the firm self-regulates at a faster rate, making self-regulation a strategic complement to public politics.

The traditional literature in political economics has mainly focused on the incentives and behavior of politicians and legislators (see Persson and Tabellini, 2002). Citizens and consumer can vote and sometimes run for office (as in Besley and Coate, 1997; Osborne and Slivinski, 1996), but boycotts are rarely considered. To the extent in which activist groups are included in the analysis, they have been assumed to lobby governments by providing information or campaign contributions (for an overview of this literature, see Grossman and Helpman, 2002).

The literature on boycotts and CSR is small but growing. As mentioned, David Baron was the first referring to "private politics," and he has also written a number of papers on the theme. In particular Baron and Diermeier (2007) analyze a model where an interest group can first make a demand to a firm. The firm can accept this demand and, in our words, "self-regulate." If the firm does not accept these demands, the activist can decide whether to initiate a boycott. The

boycott is costly to the firm, but some of the costs can be saved if the firm gives in and self-regulates after the boycott has started. If this fraction of cost-saving is small, however, it is too late for the firm to save on the costs (in this case, the voters are not very “forgiving”). The firm is then never conceding to the demands after the boycott has actually started. Anticipating this, it is not worthwhile for the activist group to initiate a boycott, either, and with an empty threat, its demands are ignored. It is thus better for the activist group if consumers are “forgiving” and, to ensure this, the activist prefers to praise the firm if it concedes.

In a more recent paper, Baron (2011) allows for two firms and two activist groups. One of these activist groups may be more “aggressive” while the other may be more “cooperative.” The two activists will, by assumption, never fight each other, but while the cooperative activist group is willing to negotiate with a firm, the aggressive activist group is instead only considering a boycott. Each firm is therefore competing to be the partner of the cooperative activist group, since the firm that is not cooperating with activists is most likely targeted by the aggressive activist group. This way, the two types of activist groups complement each other. These models are static, however, or they consist of just a few stages. For our analysis, in contrast, the long time horizon turns out to be crucial.¹

War-of-attrition games are often used to study industrial organization and game theory.² In political economy, they have also been used to explain gridlock in legislatures (Alesina and Drazen, 1991). Technically, however, the first waiting game (in phase one) between the firm and the activist is *not* a war-of-attrition, since the firm is *not* hoping that the activist first makes the move (which would initiate the boycott). For that reason, this game does not have as equilibria the asymmetric corner-solutions that are typical (and must be assumed away) in standard war-of-attrition models. In this sense, the first (phase one) waiting-game is instead more similar to the equilibrium analyzed by Harstad (2011), who studies whether or not a regulator is going to compensate a private owner for conservation.

¹Baron (2010) looks on cooperative arrangements where various types of activist groups can enforce cooperative behavior. For other models of boycotts, see Diermeier and Van Mieghem (2008), Innes (2006), and Delacote (2009). For an experimental study of boycotts, see Tyran and Engelman (2005).

²War-of-attrition games were first applied to biological settings (Maynard Smith, 1974). There, as well as in economics, "the object of the fight is to induce the rival to give up. The winning animal keeps the prey; the winning firm obtains monopoly power. The loser is left wishing it had never entered the fight" (Tirole, 1998:311). The definition by Muthoo (1999:241) is similar.

The next Section 2 introduces the formal model, analyzed by backwards induction in Section 3. Section 4 discusses how to endogenize the rate of regulation, while an extension are discussed in Section 5. Section 6 concludes.

2 The Model

Time is continuous and infinite, and players share a common discount rate $r \in (0, \infty)$. There is one firm, which, in the status quo, enjoys a stream of instantaneous profit equal to p_0 . At any point in time during the game, the firm can decide to “self-regulate.” This action reduces its profit to $p_R < p_0$ and ends the game (with R standing for *restriction* or *regulation*). An activist group (“the activist”) benefits from such regulation, since the better practice would increase the activist’s flow payoff from u_0 to $u_R > u_0$. Intuitively, a change in business practices such as decreased emissions or investments in energy-saving technologies may be better for the environment, although the price is paid by the firm. We do not make any assumptions about whether or not regulation is an efficient outcome, but we assume that a transfer is impossible, so in a static environment, the firm would not agree to regulate even if $p_R + u_R > p_0 + u_0$. This assumption is realistic as activists may not want to pay out of reputation concerns, collective action problem, or liquidity constraint. The decision to regulate is irreversible: once made, it cannot be revoked (for example, one can think about regulation that involves sunk cost instead of the change in the flow payoffs).

To force the firm to self-regulate, the activist can organize a boycott. The activist may decide to trigger a boycott at any moment, and likewise they can stop at any moment regardless of whether the goal of the boycott (regulation) has been achieved; however, we assume, again for simplicity, that once a boycott is stopped, it cannot be restarted. (In a richer model where activists care about their reputation for toughness, calling the boycott off may undermine the groups ability to organize any boycotts in the future.) The game, consequently, may be subdivided into three time periods: before the boycott, during the boycott, and after the boycott has ended. The game ends if the firm self-regulates or the government imposes regulation. This makes it necessary to define payoffs in four situations:

(Flow) Payoffs	Status quo	During a boycott	With self-regulation	Government regulation
The activist (A):	u_0	u_B	u_R	u_G
The firm (F):	p_0	p_B	p_R	p_G

For now, we let the regulator be exogeneous by imposing regulation at the given rate g_a before a boycott is started, at rate g_b during a boycott, and at rate g_c after the boycott is ended. We will later introduce the government as a player in the game and endogenize these rates. Until then, however, the reader is free to assume $g_a = g_b = g_c$, for example.

During the boycott, the firm's profit is $p_B < p_R < p_0$ (so the firm prefers regulation to eternal boycott, for otherwise the model is not interesting), whereas activists get $u_B < u_0 < u_R$. We do not need to assume that the boycott ends automatically if the firm has imposed regulation; this will anyway happen in equilibrium. In other words, boycotts are costly both for the firm and for activists. In addition, we assume that at the moment a boycott starts, the firm's reputation suffers and the present-discounted value of its profit decreases by $K > 0$. The activist, however, may get a reputation boost equivalent to an instantaneous payoff of $B > 0$. Here, we follow Baron and Diermeier (2007), who make similar assumptions.

At every point in time, the history of the game is simple to describe. Suppose the game has not yet ended. If the boycott has not started, no actions have been taken. During a boycott, the history is simply the time at which the boycott started. If the boycott has ended, the history specifies the time at which the boycott started and the time at which it ended. Of course, the specification of these times are payoff-irrelevant and if one player ignores them, the other can ignore them, too. To simplify, we will thus focus on the Markov perfect equilibria (MPEs) where strategies are not functions of the specific times at which a boycott started or ended. The strategies will, of course, be mutually best responses as a function of whether the boycott has started/ended or not.

At each moment in time, there is a government in power. From time to time the government is challenged in elections, and we assume that elections happen at random times at rate h (i.e., they follow Poisson process) and are "instantaneous". At the time of elections, a contender government is chosen from a large pool of possible governments, and both the incumbent and the challenger make binding promises to impose regulations (R) right after elections or not (N). We assume that a promise to regulate is implemented immediately, while a promise not to regulate is binding for the elected government until the next elections where it can run a new

campaign. Regulation is costly to the government, and the cost is $C \geq 0$. We find it convenient to assume that there is a continuum of voters who can be of three types: those wanting regulation (type μ_R with probability λ_R), those sympathising with the firm (μ_N with probability λ_N), and independent voters (μ_0 with probability $\lambda_0 = 1 - \mu_R - \mu_N$). Here, μ denotes the net benefit that the group of voters get from regulation, so $\mu_R > 0$, $\mu_0 = 0$, and $\mu_N < 0$. (We follow probabilistic voting model as in Besley 2005.) A voter i of type s votes for the incumbent government G against challenger H if and only if

$$\mu_s \mathbf{I}_{\{G \text{ promises } R\}} + \theta + \zeta_i^s > \mu_s \mathbf{I}_{\{H \text{ promises } R\}}; \quad (1)$$

here, θ is the population's aggregate shock distributed uniformly on $[-\frac{1}{2A}, \frac{1}{2A}]$ and ζ_i^s is individual shock with group-specific uniform distribution on $[-\frac{1}{2A_s}, \frac{1}{2A_s}]$; here, A_R, A_N, A_0, A are sufficiently large, and all shocks are independent. (We also drop time indices for brevity, but we assume shocks in different elections are independent.) The government gets flow payoff G every period it is in power, and being out of power brings utility 0 (a government which loses power never comes back). Intensities of preferences are assumed to be constant over time for now; in an extension, we relax this and allow them to be different. For example, since boycotts attract a lot of media attention, voters from the first group may put a stronger emphasis higher preferences.

More formally, we assume that μ_R and μ_N are taken from some distribution $F_s(\mu_R, \mu_N) = (F_s^R(\mu_R), F_s^N(\mu_N))$, and for simplicity that they are distributed independently for each $s \in \{a, b, c\}$. Here, a stands for the ante-stage, b for the stage during the boycott, and c for after the boycott. We make the following assumption.

Assumption 1 *Distribution F_a^R first order stochastically dominates F_c^R , which in turn first order stochastically dominates F_a^R . Similarly, istribution F_a^N first order stochastically dominates F_c^N , which in turn first order stochastically dominates F_a^N .*

This Assumption ensures that the support for regulating the firm is strongest during the boycott and is weakest before the boycott has started, with the stage after the boycott is called off in the middle. This is natural: before the boycott, few people are aware of the activists' cause, and thus regulation is not widely supported; at best, people are indifferent. A boycott raises awareness a lot, and more voters become passionate about the issue, while supporters of the

firm may, in principle, get some doubt and will in general be more likely to support regulation in this particular case. After the boycott stops, people will not hear about the issue from the media every day, but it has already attracted attention, and so the support for regulation is likely to be between those before and during the boycott. Support for the firm is assumed to have the opposite order of stochastic dominance.

Elections are assumed to be instantaneous, and once elections are called, the firm can no longer self-regulate before the government elected fulfils its promise. We start with the assumption that both the firm and activists get the same payoff both if the firm self-regulates and if the government regulates the firm. We relax these assumptions later in Section 4.

3 The Analysis

We first make a shortcut by assuming that the government regulates the firm at some rate which is given exogenously, and which is equal to g_a (for *ante*) before the boycott, g_b during the *boycott*, and g_c after the boycott is *called* off. This helps us develop the intuition about the government's impact on the interaction between the firm and the activist group, and most importantly on the timing and duration of boycotts. In Section 4 we show that these rates are well defined and uniquely determined in a Markovian equilibrium, and we get further results on how political economy considerations influence the rates of government interventions, and thus the outcome of private politics. We proceed by backward induction and first consider the subgame where the boycott stopped.

3.1 The post-boycott game

We start with analysis of the subgame after the boycott is finished. Here, activists cannot start a boycott, and the government intervenes and regulates at rate g_c . Given our assumption that the firm's payoffs after self-regulation and after government regulation are the same, the firm has no incentives to self-regulate. Consequently, the expected continuation payoffs of the firm and activists are the following (all derivations and proofs are in the appendix):

$$P_c = \frac{1}{r} \frac{g_c p_R + r p_0}{g_c + r}, \quad (2)$$

$$U_c = \frac{1}{r} \frac{g_c u_R + r u_0}{g_c + r}, \quad (3)$$

respectively. We can immediately state the following result.

Proposition 1 *The post-boycott game has a unique MPE. In this MPE, the firm does not self-regulate, and the expected payoffs of the firm and activists are given by (2)–(3).*

Intuitively, the firm is better off if the rate of regulation (g_c) is small, while the activist benefits from a large g_c .

3.2 The war-of-attrition during boycotts

We next examine the strategies of activists and firm *during* the boycott. Motivated by our desire to study the influence of the government intervention as compared to the situation of purely private politics, we assume that government intervention (at least during the boycott) is not sufficiently frequent. Formally, we make the following Assumption 2.

Assumption 2 $\frac{h}{r} < \frac{u_0 - u_B}{u_R - u_0}$.

Intuitively, Assumption 2 means that if the firm does not self-regulate, the activist will give up and stop the boycott. The only reason for activists to continue boycott given such strategy of the firm is if the government's rate of intervention is much higher during the boycott than after the boycott, i.e., if $g_b \gg g_c$. Since $g_b - g_c$ is capped by h , which is not too large, this possibility is ruled out. Also, if $g_b < g_c$, then Assumption 2 may be omitted.

We then have three Markov Perfect equilibria in the subgame starting with the boycott. In two of them, the boycott ends immediately. This is a general feature of war of attrition games; see Tirole (1998) for an extensive discussion.³ In one equilibrium, the firm self-regulates immediately, while the activist never ends a boycott, anticipating that the firm will give in immediately. In the other, the activist ends the boycott immediately, while the firm never self-regulates in the hope that activists quit. In these equilibria, boycotts end immediately, so the

³War-of-attrition games were first studied by Maynard Smith (1974) in biological settings, but are often applied in economics. According to Tirole (1998:311) "the object of the fight is to induce the rival to give up. The winning animal keeps the prey; the winning firm obtains monopoly power. The loser is left wishing it had never entered the fight." Muthoo (1999:241) provides a similar definition. In this paper, in contrast, the buyer is perfectly happy with the status quo, and he does not hope that the seller will act. Once the buyer acts, he is also very happy that he did not give in earlier.

subgame becomes of little interest. We therefore focus on the mixed strategy equilibrium in the war of attrition, leaving formal analysis of the equilibria with boycotts ending immediately to Appendix B.

The unique MPE which features boycotts that last positive amount of time is pinned down by the equilibrium rates of firm and activists taking action that stop the boycott (self-regulate and call the boycott off, respectively). The firm wants activists to stop the boycott and the activist wants the firm to self-regulate. In this MPE, both parties make their moves at some rate which is neither 0 nor ∞ . Denoting the equilibrium rates by f_b and a_b (firm's and activist's actions during boycott), we can write the following equations ensuring that the firm and the activist are willing to randomize, respectively:

$$p_R = \frac{a_b \frac{g_c p_R + r p_0}{g_c + r} + g_b p_R + r p_B}{a_b + g_b + r}; \quad (4)$$

$$\frac{g_c u_R + r u_0}{g_c + r} = \frac{f_b u_R + g_b u_R + r u_B}{f_b + g_b + r}. \quad (5)$$

These equations pin down the equilibrium a_b and f_b :

$$a_b = (g_c + r) \frac{p_R - p_B}{p_0 - p_R}; \quad (6)$$

$$f_b = (g_c + r) \frac{u_0 - u_B}{u_R - u_0} + g_c - g_b. \quad (7)$$

In this MPE, continuation payoffs are particularly easy to compute. The firm is indifferent between playing its equilibrium strategy and self-regulating immediately. The activist is indifferent between playing equilibrium strategy and calling the boycott off. Consequently,

$$P_b = \frac{1}{r} p_R; \quad (8)$$

$$U_b = U_c = \frac{1}{r} \frac{g_c u_R + r u_0}{g_c + r}, \quad (9)$$

This establishes the following proposition.

Proposition 2 *There is a unique MPE where boycott is expected to last a positive amount of time. The activist ends the boycott at rate (6), while the firm self-regulates at rate (7).*

The intuition for the comparative statics is interesting. Suppose regulation is very costly to the firm (so that p_R is small). Then, the firm is less willing to self-regulate, and, to be willing to randomize, the activist must end the boycott at a lower rate. Similarly, if the firm is tolerant

to boycotts (so that the firm's profits are not much affected, and p_B is relatively high and close to p_0), or if the firm gains a lot if activists stop the boycott (p_0 is high), then only prolonged boycotts, manifested in low probability of boycott end, may make the firm self-regulate.

It may seem paradoxical at first, but the more activists want the firm to regulate (the higher is u_R , or the lower the u_0), the less likely the firm is to self-regulate. To understand the reason, it is critical that during the boycott, the total rate of regulation (by the firm and the government) is higher than after the boycott. Indeed, (7) implies

$$(f_b + g_b) - g_c = (g_c + r) \frac{u_0 - u_B}{u_R - u_0} > 0. \quad (10)$$

Consequently, more desire to regulate the firm necessitates continuation of boycott. But to prevent the activist from having continuing boycott as a unique best response, the firm must undermine, in equilibrium, the purpose of the boycott: in other words, it must regulate less frequently. A similar logic explains why the more costly it is for activists to organize boycott, the more likely the firm to self-regulate (otherwise activists would be too compelled to call off the boycott, so only a firm which is likely to concede can make boycotts possible).

We summarize the above discussion in the following proposition.

Proposition 3 *The boycotts are longer under the following conditions:*

(a) p_R decreases (firm dislikes regulation), p_B increases (firm is tolerant to regulation), p_0 increases (firm has a lot to gain by ending the boycott and avoiding regulation). In these cases, the activist is less likely to call the boycott off, and the likelihood that the boycott is ended by the firm opting to self-regulate increases.

(b) u_R increases (activists are more willing to ensure that the firm is regulated), u_B increases (boycott is less costly for activists), u_0 decreases (absence of regulation is less acceptable to the activist). In these cases, the firm is less likely to give in during the boycott and self-regulate, and the boycott, while longer in expectation, is more likely to be ended by the activist than the firm.

Lastly, we consider the effect of government regulation on the duration of boycotts, and on the way they are likely to end. From (7), we immediately notice that $f_b + g_b$ remains a constant as g_b increases or decreases. This means that increased government intervention during the

boycott will completely crowd out the firm's rate of self-regulation.⁴ Moreover, a change in g_b does not affect the duration of the boycott. However, anticipated government intervention after the boycott ends (higher g_c) makes the boycotts unambiguously shorter, and in fact both the activist and the firm are willing to act faster. This is intuitive: the activist now has more to win from stopping, and the firm has less to win if it makes the activist stop the boycott; this makes both parties want to act faster. The precise way in which the boycott is likely to end is, however, ambiguous. If regulation is very painful to the firm, so p_R is low, then the firm is more likely to self-regulate than activists to call the boycott off. If, however, boycott hurts the firm a lot and regulation hurts only a little, then more regulation will actually imply that activists will be more likely to stop the boycott than the firm is to self-regulate.

The following proposition summarizes the effect of government regulation on the duration of boycotts.

Proposition 4 *Government intervention during the boycott has no effect on the expected duration in boycott, and only crowds out the firm's self-regulation. Expectation of government intervention if the boycott is called off make boycotts shorter. Government intervention makes the boycott more likely to succeed (i.e., end with firm self-regulating) if p_R is low, p_B is high, p_0 is high, u_R is low, u_B is low, u_0 is high, and less likely to succeed otherwise.*

Proposition 4 implies, in particular, that government intervention is likely to have a positive effect on boycott precisely where it is needed less (p_R is low and u_R is low). If activists are very passionate about regulating the firm, and the firm not too averse to regulation, then boycotts will be relatively ineffective, and the more likely the government is to intervene, the shorter the boycott will be, and the more likely it is that it will be ended by the activist.

3.3 The pre-boycott game

Having studied the war of attrition during the boycotts, we can now consider the stage before the activist has started a boycott. We analyze the game here again under the assumption that a boycott is expected to last a positive amount of time, so that the mixed strategy equilibrium

⁴This complete crowding out would not hold if the firm were more willing to self-regulate than to have the government regulate it. We discuss this in more detail in Section 5

of the war of attrition during-the-boycott subgame is played. (We analyze other equilibria in Appendix B). The trade-off involved in the before-the-boycott round is the following. The activist hopes, as before, that the firm starts to self-regulate, as maintaining a boycott is costly. The firm, on the other hand, is willing to continue its business as usual, hoping that the activist does not start a boycott. In contrast to the previous subsection, the firm hopes that the activist is *not* acting. This stage, therefore, does not feature a standard war-of-attrition game; nevertheless, many insights that are typical for war of attrition will hold here as well.

Assumption 3 $0 < B < \frac{u_R - u_0}{h+r}$ and $g_a \leq g_c$.

This assumption is very mild, and is made to simplify the analysis by ruling out extreme cases which are not particularly natural. The first part implies that the activist benefit from boycott B is not too high, so that if he knows for sure that the firm will give in very fast, he would not start a boycott anyway just to claim the benefit. (It is obvious that if B is high enough, there will always be an equilibrium where both the firm and the activist act immediately; we rule this possibility out to focus on the interesting case.) The second part is a sufficient condition for the opposite: if the firm is expected never to give in before a boycott starts, the activist will actually initiate a boycott. It turns out that the only reason for the activist to wait is the hope that the government will intervene faster if he does not start a boycott rather than if he does and later calls it off. This is unrealistic, as a boycott is likely to raise citizens' awareness of the issue and thus put more pressure on the government if a boycott has happened. Moreover, as we will see in Section 4, $g_a \leq g_c$ will necessarily be the case once we endogenize government intervention. (Notice that if $g_a > g_c$, but h , which caps both g_a and g_c , is sufficiently small, then our analysis will go through as well.)

If Assumption 3 holds, then there is a unique MPE under which boycotts can last a positive amount of time. Denote the equilibrium rate at which the firm self-regulates by f_a and the equilibrium rate at which the activist initiates the boycott by a_a . The firm and the activist are both willing to randomize if, respectively:

$$p_R = \frac{a_a(p_R - rK) + g_a p_R + r p_0}{a_a + g_a + r}; \quad (11)$$

$$\frac{g_c u_R + r u_0}{g_c + r} + r B = \frac{f_a u_R + g_a u_R + r u_0}{f_a + g_a + r}. \quad (12)$$

These equalities pins down the unique equilibrium a_a and f_a :

$$a_a = \frac{p_0 - p_R}{K}; \quad (13)$$

$$f_a = (g_c + r) \frac{B}{\frac{u_R - u_0}{g_c + r} - B} + g_c - g_a. \quad (14)$$

In this mixed equilibrium, the payoffs are given by

$$P_a = P_b = \frac{1}{r} p_R; \quad (15)$$

$$U_a = U_b + A = \frac{1}{r} \frac{g_c u_R + r u_0}{g_c + r} + A. \quad (16)$$

We have the following proposition.

Proposition 5 *There exists a unique MPE in which a boycott is expected to last a positive amount of time. In this equilibrium, the activist initiates a boycott at rate (13) while the firm self-regulates at rate (14). After the boycott has started, the activist stops it at rate (6), while the firm self-regulates at rate (7). If the boycott ends, the firm will not self-regulate. The expected payoffs of the firm and the activist are given by (15)–(16).*

We can now establish comparative statics results for the stage before the boycott has started. A boycott will start earlier if the firm dislikes regulation (p_R is low or p_0 is high). Intuitively, in either case, the firm is not willing to self-regulate, and only the higher threat of boycott may make the firm randomize. Similarly, if the reputational damage that the firm may suffer is high (K is high), the likelihood of a boycott decreases; indeed, then a less threat of a boycott is sufficient to make the firm self-regulate. This means, in particular, that the firm is more likely to avoid a boycott which has disastrous consequences. In other words, boycotts are more likely when the firm dislikes regulation but is relatively resistant to boycotts, and are less likely if the firm is tolerant to regulation, but a boycott would hurt a lot.

The rate of self-regulation, f_a , is increasing in u_0 and decreasing in u_R . Intuitively, the more activists desire regulation (u_R is high or u_0 is low), the less likely it is to happen. The reason is similar to the one we used during the boycott: higher desire to have regulation decreases the activist's willingness to start a boycott, as doing so will make the firm less likely to self-regulate so as to keep activists indifferent. Similarly, if a boycott will bring a lot of benefits to activists, aside from influencing the firm (so B is high), then the firm has to self-regulate at a higher pace. In other words, f_a is increasing in B .

This comparative statics results are summarized in the following proposition.

Proposition 6 *In the unique MPE with positive expected duration of boycotts:*

(a) *The boycott starts sooner if: p_R decreases (firm dislikes regulation), p_0 increases (firm is not willing to self-regulate), K decreases (reputational damage for the firm in the case of boycott is high).*

(b) *The firm is more likely to self-regulate before the activist starts a boycott if: u_R decreases (activists are less willing to ensure that the firm is regulated), u_0 increases (absence of regulation is more acceptable to the activist), B increases (the direct reputational benefit of the activist if he starts a boycott is high).*

Notice how Proposition 6 compares with Proposition 3 established earlier. If p_R is small and p_0 is high, a boycott is likely to start earlier and last longer. Hence, boycotts are more likely to be observed in cases of firms that are less willing to self-regulate. With respect to activist's payoffs from regulation and absence thereof, the results are the following. If activists are more willing to have the firm regulated (u_R is high and/or u_0 is low), then the firm is less likely to self-regulate, both before a boycott starts and after it started. Consequently, a firm that faces very determined activists is likely to face a boycott along the equilibrium path, but will not be willing to give in. Essentially, firms which are willing to avoid regulation and facing determined activists will experience boycotts which start soon and last long, whereas if a firm can tolerate regulation and activists are not desperate about it, then boycotts are unlikely to happen, and once they happen they end soon. In other words, strong polarization of the interest of the firm and the activist group is most likely to lead to boycotts.

As before, we study the impact of government intervention on the stage before the activist started a boycott. From (13), it is clear that the possibility of government intervention does not change the rate at which a boycott starts; this happens because the firm's indifference condition is not affected by a higher chance of government intervention. The firm, however, is more likely to self-regulate, but only if expects the government to be more likely to intervene after the boycott is over, i.e., if g_c is high. If g_a increases instead, then the firm is less likely to self-regulate, and in fact the chance of government intervention before the boycott begins crowds out self-regulation by the firm. Formally, we have the following result.

Proposition 7 *Government intervention has no effect on the rate at which the activist initiates the boycott. The expectation of government intervention makes a boycott less likely to start overall. This effect of the government is stronger u_R is low, u_0 is high, or B is high.*

In other words, we have established that government intervention makes a boycott less likely, but if it happens, it is more likely to succeed. Here, both effects go through higher chance of the firm being regulated, either by itself or by the government, if the government is expected to intervene eventually. The effect on the government of boycotts is unambiguously stronger if regulation is not too important to activists. In contrast, an environment with activists that benefit from regulation a lot will have more frequent and longer boycotts, and the government intervention will not have a major mitigating effect.

4 Endogenous Government Actions

We start our analysis by focusing on a myopic government, which cares only about immediate reelection. A farsighted government will have to take into account the prospects of future elections when deciding on today's platforms. We get back to this case later.

4.1 Myopic government

We first consider the chances of the government to be reelected. If both the incumbent government G and the challenger H offer the same platform s then, due to symmetry of (1), both are reelected with probability $\frac{1}{2}$. Suppose that G promises regulation R and the incumbent promises no regulation (the opposite case is similar). In that case, an individual i from group R (wanting regulation) votes for the incumbent with probability

$$\Pr(-\zeta_i < \mu_R + \theta_R) = \frac{1}{2} + \frac{1}{2A_R}(\mu_R + \theta). \quad (17)$$

Similarly, an individual from group 0 (indifferent) votes for the incumbent with probability

$$\Pr(-\zeta_i < \theta_0) = \frac{1}{2} + \frac{1}{2A_0}\theta, \quad (18)$$

while one from group N (supporting the firm) votes for the incumbent with probability

$$\Pr(-\zeta_i < \mu_N + \theta_0) = \frac{1}{2} + \frac{1}{2A_N}(\mu_N + \theta). \quad (19)$$

The incumbent G wins only if it gets at least share $\frac{1}{2}$ of votes, and this probability equals

$$\begin{aligned} \Pr\left(\pi_G > \frac{1}{2}\right) &= \Pr\left(\lambda_R \frac{1}{2A_R} (\mu_R + \theta) + \lambda_0 \frac{1}{2A_0} \theta + \lambda_N \frac{1}{2A_N} (\mu_N + \theta) > 0\right) \\ &= \frac{1}{2} + \frac{1}{2A} \frac{\frac{\lambda_R}{A_R} \mu_R + \frac{\lambda_N}{A_N} \mu_N}{\frac{\lambda_R}{A_R} + \frac{\lambda_0}{A_0} + \frac{\lambda_N}{A_N}}. \end{aligned} \quad (20)$$

The following proposition follows.

Proposition 8 *In elections, for almost all parameter values, the incumbent G and the challenger H choose the same platform and have the same probability of winning. Regulation is promised if and only if*

$$\frac{\frac{\lambda_R}{A_R} \mu_R + \frac{\lambda_N}{A_N} \mu_N}{\frac{\lambda_R}{A_R} + \frac{\lambda_0}{A_0} + \frac{\lambda_N}{A_N}} > C. \quad (21)$$

The firm is more likely to be regulated by the government as a result of elections if μ_R is higher and $|\mu_N|$ is lower, so supporters of regulation are more passionate than those opposing it, and also if λ_R is high and λ_N is low (many people support regulation and few oppose it). If regulation is costly, it is less likely, while if the government has intrinsic reasons or preferences to regulate, regulation is more likely.

Proposition 8 summarizes the idea that the two competitors will choose the policy that is expected to bring more votes. The number of supporters and opponents of regulation, λ_R and λ_N , matter, but equally important are the intensities of preferences. A random shock is less likely to affect a person who is vocal supporter of one of the alternative than one who is close to be indifferent. Since we assumed that regulation comes at a cost C , in a symmetric situation, regulation will not occur. (Our results will not change much if we assume that the government has a strong desire to regulate and bureaucratize.)

Since we assumed that shares of population are constant, but intensities may vary, the expected probability of regulation in stage $s \in \{a, b, c\}$ is

$$\rho_s = \Pr\left(\frac{\frac{\lambda_R}{A_R} \mu_R + \frac{\lambda_N}{A_N} \mu_N}{\frac{\lambda_R}{A_R} + \frac{\lambda_0}{A_0} + \frac{\lambda_N}{A_N}} > C \mid F_s(\mu_R, \mu_N)\right), \quad (22)$$

where F_s is the distribution that μ_R and μ_N are taken from. These probabilities depend on the stage of the game. Given Assumption 1, we have $\rho_b > \rho_c > \rho_a$, and therefore $g_b > g_c > g_a$ (more precisely, we have $g_s = \rho_s h$ for any $s \in \{a, b, c\}$).

An interesting effect comes if we compare preferences of the activist (the difference between u_R and u_0) and voters preferences for regulation, the difference between μ_R and μ_N . These need not be similar: first, activists and voters are different individuals, but also there is a difference about the distribution of preferences. Passionate activists and indifferent voters would correspond to a case of a strong special interest by a few individuals, activists, while the society at large is relatively inert (although the aggregate effect may be positive or negative). Conversely, if activists are relatively tolerant to current practices of the firm ($u_R - u_0$ is positive but small), whereas as voters, people can make regulation of the firm a primary reason for supporting one politician/government against the other, then we are in the case of issues which are important broadly, but not to any small group in particular, so not many people would take the burden of being activists for this cause.

Combining this discussion with our earlier results (Propositions 4 and Proposition 7), we get the following. If voters care a lot about an issue, the government is more likely to regulate as a result of any given elections. This puts more pressure on the firm to self-regulate both before a boycott and during the boycott, while activists simply become more reliant on government regulation and are more willing to call off the boycott if it started. In general, if voters support regulation, then boycotts are less likely to start (because the firm will self-regulate promptly), and if a boycott starts, it is likely to be short. As a result, boycotts are less likely if people are ready to vote for regulation, but are not willing to make the firm self-regulate by threatening with or by organizing boycotts. Conversely, if an issue is unlikely to get popular support and thus impact the government, while an activist group is passionate enough about regulating the firm so they will bother to organize and sustain a boycott, then boycotts are more likely and will last longer, while government will hardly intervene to regulate.

The next proposition summarizes the above discussion.

Proposition 9 *The rate of government intervention is highest during the boycott and lowest before the boycott. Moreover, a boycott is more likely to take place and is expected to last longer if voters do not put sufficient pressure on the government to regulate the firm. Conversely, if the voter's pressure is sufficient, the government is more likely to regulate, and a boycott is less likely to take place, and if it does, its expected duration is shorter.*

4.2 Farsighted government

Suppose now that the government is farsighted, i.e., it not only cares about immediate election, but also about the stream of payoffs that election is going to yield. In that case, our main results remain largely unchanged, however, there are novel and interesting effects.

We start with formulating the general result.

Proposition 10 *There exists a unique Markov Perfect equilibrium. In this equilibrium, the rate of government intervention is highest during the boycott and lowest before the boycott.*

With farsighted government, the condition under which the government decides to regulate is different. As h increases, the time horizon for the government shrinks; indeed, with more opportunities for the opposition to come to power, the government does not value reelection as much. Consequently, if regulation is costly ($C > 0$), then a higher h may actually *decrease* the equilibrium values of g_a , g_b , and g_c .

So far, we have assumed that the government has no intrinsic preferences for regulating versus not regulating the firm (apart from the cost C , which it only had to incur if chose to regulate the firm itself). Suppose that the government prefers the firm to be regulated. We then have the following feedback effect: As the government increases the likelihood that the firm is regulated, the firm will respond by self-regulating at a higher rate at all stages (Propositions 3 and 6). However, this will decrease the need for the government to self-regulate. We leave a more detailed study of government preferences, as well as lobbying by the firm and the activist group, for future research.

5 Extensions

In this section, we consider several relevant extensions. We use the notation g_a , g_b , g_c of Section 3 for simplicity; it will be clear that our results will continue to hold if these are endogenized as in Section 4.

So far, we have assumed that the payoffs of the firm F and the activist A do not depend on whether the firm self-regulated or the government stepped in, and were equal to p_R and u_R , respectively, in both cases. Here we relax this assumption, and consider the case where the government's intervention leads to different payoffs. We leave the notation p_R and u_R for the

case where the firm self-regulates, and let p_G and u_G be the payoffs of the firm and the activist in the case of government regulation.

It is reasonable to assume that $p_G \leq p_R$: the firm, even if compelled to self-regulate, would perhaps find ways to do it in an optimal and efficient way, while the government will not necessarily do so. Alternatively, we may think that the government, once it steps in, makes the firm impose more restrictions than a reasonable compromise between the firm and the activist could achieve. On the other hand, both cases with $u_R > u_G$ and $u_G > u_R$ may be relevant. The former is likely if the activist believes that the government will regulate the firm in a way which is inefficient and costly to the society; the latter is likely if they believe the government is able to do the right thing while the firm, even if forced to self-regulate, will shirk in the largest extent possible.

In what follows, we focus on the case where $|p_G - p_R|$ and $|u_G - u_R|$ are not too large (in other words, p_G and u_G are in the neighborhood of p_R and u_R , respectively, and $p_G < p_R$).

As in Section 3, we proceed by backward induction. We first consider the stage after the boycott is called off. It is no longer true that the firm has no reason to self-regulate: if the possible regulation by the government is worse than self-regulation (and indeed we argued that $p_G < p_R$ is natural), the firm may self-regulate so as to avoid government regulation. However, if the difference $p_R - p_G$ is not too large, then in the last stage the firm does not self-regulate, and the expected payoffs of the firm and the activist are given by

$$P_c = \frac{1}{r} \frac{g_c p_G + r p_0}{g_c + r}; \quad (23)$$

$$U_c = \frac{1}{r} \frac{g_c u_G + r u_0}{g_c + r}. \quad (24)$$

Proceeding to the stage during the boycott, we again focus on the case with mixed strategy MPE in the war of attrition. This equilibrium is characterized by rates a_b at which the boycott stops and f_b at which the firm self-regulates, and is pinned down by the equations

$$p_R = \frac{a_b \frac{g_c p_G + r p_0}{g_c + r} + g_b p_G + r p_B}{r + a_b + g_b}; \quad (25)$$

$$\frac{g_c u_G + r u_0}{g_c + r} = \frac{r u_B + f_b u_R + g_b u_G}{r + f_b + g_b}. \quad (26)$$

These equations have the solution

$$a_b = (g_c + r) \frac{p_R - p_B + \frac{g_b}{r} (p_R - p_G)}{p_0 - p_R - \frac{g_c}{r} (p_R - p_G)}; \quad (27)$$

$$f_b = (g_c + r) \frac{u_0 - u_B + \frac{g_b - g_c}{r} (u_R - u_G)}{u_R - u_0 + \frac{g_c}{r} (u_R - u_G)} + g_c - g_b. \quad (28)$$

Let us compare the equations (27)–(28) to (6)–(7) that we obtained in Section 3. Clearly, as p_G decreases down from p_R , so government regulation becomes more painful for the firm, the higher is a_b . The reason is simple: for a fixed a_b , the firm would prefer to self-regulate immediately, and since in the equilibrium it must be indifferent, we must have a_b increase, so that boycott is likely to end faster. Note that this effect is stronger either if g_b is high or g_c is high; naturally, the firm would be willing to self-regulate both if the government may step in during the boycott and if it is expected to step in after it, as then the firm has less to win if the activist decides to call the boycott off.

The comparative statics with respect to the difference $u_R - u_G$ is more complicated, and the reason is that more effects are at play. On the one hand, as u_G decreases, the activists want the firm to self-regulate, and do not want the government to step in. If $g_b < g_c$, then continuing boycott will now be a better strategy, and as a result the firm will indeed be less likely to self-regulate during the boycott, thus prolonging the boycott in equilibrium. However, as we argued in Section 4, $g_b > g_c$ is a more likely scenario, and thus the activist faces a trade-off: the payoff from continuing the boycott is lower, as government regulation is the more likely outcome, but stopping the boycott also yields a lower payoff. The firm may therefore be likely willing to self-regulate, but if the risk of government intervention during the boycott is very high, then it must be more likely to self-regulate and avoid government intervention so as to keep the activist indifferent.

In Subsection 3.2, an increase in g_b would completely, one-to-one, crowd out f_b . Here, it is not necessarily the case. In fact, (7) implies that an increase in g_b increases the likelihood that the firm will be regulated and shortens the expected duration of a boycott if and only if $u_G < u_R$. This is intuitive: If the activist prefers the firm to self-regulate, then an increase in government's rate of intervention coupled with a corresponding decrease in firm's rate of self-regulation will make him less willing to continue the boycott. To make him indifferent, the firm needs to self-regulate more frequently. Conversely, if the activist prefers government regulation, then an increase in the g_b would disproportionately decrease f_b . As a result, if activists prefer

the firm to self-regulate, then more government intervention leads to shorter boycotts, otherwise the boycotts are likely to be shorter, but only because the activists are more likely to call off.

We summarize the above discussion in the following proposition.

Proposition 11 *If the government regulation is worse for the firm than self-regulation, then activists are more prone to stop the boycott. Anticipation of government intervention also make the firm more likely to self-regulate. However, a higher likelihood of intervention during boycott may actually lead to less regulation if activists prefer government regulation to self-regulation by the firm.*

We now continue to the first stage of the game. Clearly, the payoffs in the continuation game after the boycott started are given by

$$P_b = \frac{1}{r}p_R; \quad (29)$$

$$U_b = \frac{1}{r} \frac{g_c u_G + r u_0}{g_c + r}. \quad (30)$$

The rates at which the activist starts a boycott and the firm self-regulates, a_a and f_a , are thus given by the following equations:

$$p_R = \frac{a_a(p_R - rK) + g_a p_G + r p_0}{a_a + g_a + r}; \quad (31)$$

$$\frac{g_c u_G + r u_0}{g_c + r} + rB = \frac{f_a u_R + g_a u_G + r u_0}{f_a + g_a + r}. \quad (32)$$

From these equations we find:

$$a_a = \frac{p_0 - p_R - \frac{g_a}{r}(p_R - p_G)}{K}; \quad (33)$$

$$f_a = (g_c + r) \frac{B + \frac{g_a - g_c}{r(g_c + r)}(u_R - u_G)}{\frac{u_R - u_0}{g_c + r} - B + \frac{g_c}{r(g_c + r)}(u_R - u_G)} + g_c - g_a. \quad (34)$$

Let us compare (33)–(34) to (13)–(14). As p_G decreases, a_a decreases; indeed, if the firm is afraid of government regulation, it is willing to self-regulate, and the activist do not need to start a boycott less often to make it indifferent. Now, since $g_a \leq g_c$ (Assumption 3), then f_a is unambiguously increasing in u_G . This means that if the activist prefers government regulation, the firm is more likely to self-regulate. Indeed, the activist is then more willing to initiate a boycott, as this will increase the chance of government regulation. To make the activist willing to wait, the firm needs to self-regulate at a higher rate.

As with the increase in g_b during the boycott, an increase in g_a before the boycott does not necessarily crowd out f_a , the self-regulation by the firm. Indeed, if g_a increases, $f_a + g_a$ will actually increase, provided that $u_R > u_G$. However, if the activist wants government regulation, and thus will be less willing to start a boycott after the increase in g_a , the the firm can afford to self-regulate much less often.

We thus obtain the following result.

Proposition 12 *A decrease in p_G makes the firm more likely to self-regulate and makes boycotts start later. An increase in u_G , i.e., higher activist's willingness to have the government regulate the firm, makes the firm more likely to regulate before the boycott starts, and therefore also makes a boycott less likely. If the government becomes more likely to intervene before the boycott, the rate at which regulation starts increases if activists prefer the firm to self-regulate, but decreases if activists prefer the government to self-regulate.*

Combining the insights from Proposition 11 and Proposition 12, we see that the more painful government intervention is for the firm, the less likely a boycott to start, and the more likely the activist is to end it. Interestingly, government intervention only increases the rate of regulation if activists want the firm to self-regulate ($u_R > u_G$). If activists prefer government to step in, then government regulation more than crowds out the firm's efforts to self-regulate.

6 Conclusion

Regulation can be imposed by the government or the firm may decide to self-regulate, perhaps after citizens, consumers, and activist groups have initiated boycotts or other types of pressure to force the firm to consider such self-regulation and corporate social responsibility. There is no reason to believe that the efficient mean of regulation will, eventually, be chosen, or that this choice is independent of the economic or nonmarket environment.

This paper has taken a close look at the dynamic strategic interactions between firms, activists, and governments. The equilibrium can be described as a war of attrition where each party waits and risks that the other parties may or may not act in the meanwhile. Each party is indifferent when considering whether to act, and they act at rates that make the other parties indifferent, as well.

We have shown that the strategic situations can be described by three subsequent games. First, the activist, rather than initiating a boycott, waits and hopes that either the firm will self-regulate or that the government will force regulation upon the firm. The government does, indeed, consider such regulation, since it is dissatisfied with the likelihood of self-regulation. The firm, on its side, consider self-regulation because it is afraid of costly governmental regulation, or that the activist will initiate a costly boycott.

Such a boycott does, indeed, occur at some rate. During the boycott game, the activist hopes that the costly boycott, which is costly for *all* parties, will force the firm to consider CSR. The firm, on its side, hopes the activists get tired (or run out of resources) and must stop the boycott. If the boycott has, indeed, been ended by the activists, the game proceeds with the firm and the government as the only players. The government hopes to save its administrative costs and that the firm will start self-regulating. Since the government is thus willing to wait, the firm does not find it necessary to start self-regulating immediately or with probability one. Again, the game is characterized as a waiting game (however, this game is not a typical war of attrition game since the firm does not hope that the government will act).

The comparative static is very rich. If regulation is important for the activist, it is less likely to happen. If regulation is costly for the firm, the boycott is more likely to start and, when it has started, it is less likely to end. If the regulator is aggressive and forces regulation upon the firm with a large probability, then the boycott is less likely to start and, if it has started, it stops sooner. The firm, on its side, is more likely to start self-regulating in this situation. These results show that public politics may be a strategic substitute to private politics such as boycotts, but it may be a strategic complement to private politics such as CSR.

While political economy, as a field, has mainly focused on the behavior of governments and politicians, there is no question that much of the politics we observe is "private" and undertaken or implemented by private actors such as consumers, activist groups, or the firms themselves. While these stakeholders are often assumed to play a role in lobbying and to affect the government's action directly, we believe it is necessary to also analyze how these actors affect each other as well as the entity that ought to be regulated. After all, governmental failure may motivate nongovernmental action.

By analyzing these stakeholders in a dynamic environment, this paper raises a host of new and interesting research questions. Future research should study alternative models of governmental

motivation and behavior. One should also allow for alternative objective functions for the activist group, the firm, and one should study a setting with multiple activist groups and multiple firms. It will then be interesting to ask which interest group that is most likely to initiate a boycott, and which firm(s) such boycotts are most likely aimed at. Furthermore, by giving interest groups a choice between private politics (where they can affect the firms directly) or public politics (where they can elect or lobby the government), we may proceed towards a theory explaining the choice between private politics and public politics.

Appendix A: Proofs

Proof of Proposition 1. If the firm decides to self-regulate immediately, in the beginning of the subgame, then its payoff is

$$P_C^R = \int_0^\infty e^{-rt} p_R dt = \frac{1}{r} p_R.$$

If the firm never self-regulates, then its payoff is

$$\begin{aligned} P_C^N &= \int_0^\infty g_c e^{-g_c t} \left(\int_0^t e^{-r\tau} p_0 d\tau + \int_t^\infty e^{-r\tau} p_R d\tau \right) dt \\ &= \int_0^\infty g_c e^{-g_c t} \left(\frac{1}{r} p_0 (1 - e^{-rt}) + \frac{1}{r} p_R e^{-rt} \right) dt \\ &= \frac{1}{r} p_0 + \frac{g_c}{r(g_c + r)} (p_R - p_0) \\ &= \frac{1}{r} \frac{g_c p_R + r p_0}{g_c + r}. \end{aligned}$$

Since $p_0 > p_R$ by assumption, we have $P_C^N > P_C^R$, so not self-regulating dominates self-regulating. Hence, the firm's expected payoff is

$$P_C = P_C^N = \frac{1}{r} \frac{g_c p_R + r p_0}{g_c + r}.$$

We can similarly compute the expected continuation payoff of the activist:

$$U_c = \frac{1}{r} \frac{g_c u_R + r u_0}{g_c + r}.$$

■

Proof of Proposition 2. If the firm never self-regulates, then the activist must stop the boycott, as follows from Assumption 2. If the activist never stops the boycott, then the firm must self-regulate, as $p_B < p_R$. Consequently, if a boycott is to last a positive amount of time, we must have $a_b, f_b \in (0, \infty)$. In that case, their values must be given by the indifference conditions (6)–(7). ■

Proof of Proposition 3. It is straightforward to compute the derivatives of (6) and (7) with respect to their arguments.

The way the boycott ends depends on realization of which Poisson process comes first. The probability that the boycott is ended by an activist equals to

$$\frac{a_b}{a_b + f_b},$$

and thus depends positively on a_b and negatively of f_b . The rest of the proposition follows. ■

Proof of Proposition 4. The result follows immediately given (6), (7), and Proposition 3.

■

Proof of Proposition 5. If the continuation game after the boycott started involves an equilibrium with payoffs given by (8) and (9), then we have the following best responses. If $a_a = 0$, then the firm will choose $f_a = 0$, since $g_a \leq g_c$. If $f_a = 0$, then $a_a = \infty$ (the activist will start a boycott immediately, for otherwise the firm will never self-regulate and $g_a \leq h$ is low). If $a_a = \infty$, then the firm is willing to self-regulate before the boycott starts, so as not to lose K , and thus we must have $f_a = \infty$. But if $f_a = \infty$, the activist is not willing to start a boycott unless B is very high, which is not the case by Assumption 3. Hence, there is no pure-strategy equilibrium.

Consequently, a_a and f_a are determined by the indifference conditions, which have a unique solution (13)–(14). ■

Proof of Proposition 6. The proof immediately follows from inspection of (13) and (14).

■

Proof of Proposition 7. The proof immediately follows (13), (14), and Proposition 6. ■

Proof of Proposition 8. Suppose that (21) holds. Notice that both get nonnegative payoffs only if elected. If both announced N , then each would have an incentive to deviate and promise R , and if one announced N and the other announced R , then (21) would imply that the cost of regulation is not enough to deter the extra probability of winning the election. If (21) does not hold, a similar reasoning implies that both will choose N . The comparative statics results follow immediately. ■

Appendix B: General Payoffs

Here, we formally analyze Markov Perfect Equilibria in which the boycott ends immediately. Recall that in Subsection 3.2, we argued that in the subgame which starts as the boycott starts, two corner MPE are possible: one where the firm immediately self-regulates and the activist never calls the boycott off, and another where the firm never self-regulates, and the activist stops the boycott immediately. The latter is equilibrium only if g_b is not too high, which is guaranteed by Assumption 2.

We first consider the former equilibrium. If the firm self-regulates immediately, the expected continuation payoff once the boycott has started are given by

$$P_b = \frac{1}{r}p_R, \quad (35)$$

$$U_b = \frac{1}{r}u_R. \quad (36)$$

Hence, in the initial stage before the boycott started, activist's best response is to start the boycott. Indeed, starting the boycott yields

$$P_a^B = \frac{1}{r}u_R + B, \quad (37)$$

while never starting the boycott yields

$$P_a^N = \frac{1}{r} \frac{f_a u_R + g_a u_R + r u_0}{f_a + g_a + r} < P_a^B. \quad (38)$$

In that case, the firm should also self-regulate immediately, as in that case it would get $\frac{1}{r}p_R > \frac{1}{r}p_R - K$ that it would get if activists start the boycott. Consequently, we have the following result.

Proposition 13 *The is always a Markov Perfect equilibrium in which the firm immediately self-regulates, both before the boycott has started and during the boycott, but not after the boycott is called off. The activist starts a boycott immediately, and once it started, it never ends.*

Clearly, the possibility outlined in Proposition 13 is not unrealistic: if activists have reputation for toughness or want to establish one, then it is a possible scenario. It is not, however, likely that we will observe it, as the firm will self-regulate immediately, and it will be hard to understand if the firm is self-regulated because of a threat of a boycott or for any other reason.

The other possibility is activist stopping the boycott immediately after it started, and the firm never self-regulating during the boycott. In this case, the continuation payoffs of the subgame after the boycott started are given by

$$P_b = P_c = \frac{1}{r} \frac{g_c p_R + r p_0}{g_c + r}, \quad (39)$$

$$U_b = U_c = \frac{1}{r} \frac{g_c u_R + r u_0}{g_c + r}, \quad (40)$$

where P_c and U_c are given by (2)–(3). Consequently, in the game prior to boycotts, the equilibrium rates of self-regulation f_a and initiating a boycott a_a are given by:

$$p_R = \frac{a_a \left(\frac{g_c p_R + r p_0}{g_c + r} - r K \right) + g_a p_R + r p_0}{a_a + g_a + r}; \quad (41)$$

$$\frac{g_c u_R + r u_0}{g_c + r} + r B = \frac{f_a u_R + g_a u_R + r u_0}{f_a + g_a + r}. \quad (42)$$

These equalities pins down the unique equilibrium a_a and f_a :

$$a_a = \frac{p_0 - p_R}{K - \frac{p_0 - p_R}{g_c + r}}; \quad (43)$$

$$f_a = (g_c + r) \frac{B}{\frac{u_R - u_0}{g_c + r} - B} + g_c - g_a. \quad (44)$$

We see that in (43)–(44), as compared with (13)–(44), f_a is the same, while a_a is larger (and, if K is small enough, infinity). The reason is that a firm is not afraid of a boycott as much, and thus to make it self-regulate, the activist must start a boycott (which is still painful to the firm as it gets $-K$) at a higher rate. As long as the solution is interior, the payoffs are still given by (15)–(16). However, this equilibrium is not particularly realistic. Here, a boycott starts and is immediately called off, and then our assumptions that the firm loses K and activists gain B for reputational reasons do not appear to be realistic. This equilibrium looks similar to the other corner equilibrium if K is small (more precisely, $K < \frac{p_0 - p_R}{g_c + r}$): in that case, the activist starts a boycott immediately and then the firm has to self-regulate immediately, too; the difference is that once a boycott starts, in the first case, the activist will never call it off, while in the second case he will stop it immediately.

As neither of these equilibria are particularly instructive (although the first one is possible in the case of tough activists), we do not focus on these in the main part of the paper to generate comparative statics results. Formally, however, we have established the following result.

Proposition 14 *If $K > \frac{p_0 - p_R}{g_c + r}$, then there is a MPE in which the activist starts the boycott at rate given by (43), and before the boycott started, the firm self-regulates at rate given by (44). If $K < \frac{p_0 - p_R}{g_c + r}$, then the activist starts the boycott immediately, and the firm self-regulates immediately. In both cases, if the boycott started, the activist stops it immediately, while the firm never self-regulates. After the boycott is stops, the firm never self-regulates.*

The two corner-MPEs in which boycotts are expected to last zero time are thus completely analyzed in Propositions 13 and 14.

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