Journal of Agricultural and Resource Economics 29(1):79–93
Copyright 2004 Western Agricultural Economics Association

Activists and Corporate Behavior in Food Processing and Retailing: A Sequential Bargaining Game

Darren Hudson and Jayson Lusk

This study examines the strategic interaction between food companies and activists using a game theoretic model of sequential bargaining in the absence of complete information. In a rather confined set of circumstances, findings indicate it is always in the best interest of the food company to comply with activists' demands. More frequently, however, there will be cases where compliance is not optimal, depending on the size of the expected effect of protest, cost of defending against protest, and the cost of protest to the activist.

Key words: activists, corporate behavior, food industries, sequential bargaining game

Introduction

You are the CEO of McDonalds. An activist group has given you an ultimatum that if you do not increase the size of your chicken pens in laying houses, they will protest your company through demonstrations and television advertisements. A public campaign against you might be costly to market share and brand equity. You don't know whether the group is willing or able to sustain a campaign against you, or whether they are trying to bluff you into doing what they want. What do you do?

Activism, as defined by critical writings, advertising, protesting, or boycotts, for example, has been an important part of American culture (Friedman, 1985). Activists represent the opinions of at least some portion of the general population (Lohmann, 1991) and attempt to use their moral mandate to influence corporate or government behavior. Evidence suggests an increasing importance of activists through either direct action (Ayers, 2000) or through pressure on institutional investors (Gillan and Starks, 2000; Kang, 2000).

The increasing pressure on corporate entities by activists (Kapstein, 2001) has led to at least some modification in corporate behavior ranging from simple corporate apologies for behavior (Belsie, 2000) to apparent preemptive moves to satisfy activists (Cook, 2000; Shepard, Betz, and O'Connell, 1997). Recent examples from the food industry provide some context for the problem.

The People for Ethical Treatment of Animals (PETA) recently targeted McDonalds and Burger King for purchasing eggs from producers who, in their view, did not offer

Darren Hudson is associate professor, Department of Agricultural Economics, Mississippi State University, and Jayson Lusk is associate professor, Department of Agricultural Economics, Purdue University. The authors thank George Hoffman for conversations relating to corporate responses to activists, seminar participants at Texas Tech University for useful suggestions, the Mississippi Agricultural and Forestry Experiment Station for funding, and two referees for assistance in model refinement. Any remaining errors belong to the authors.

Review coordinated by DeeVon Bailey.

sufficiently large pens for proper animal movement (along with issues regarding handling practices). Both McDonalds and Burger King acquiesced to PETA's demands without much effort on the part of PETA to stage demonstrations, despite the considerations that (*a*) this action would increase the restaurant chains' cost structure for eggs (Smith, 2001), and (*b*) increased cost likely could not be passed along to consumers without loss of market share. Publicly released financial records reveal that McDonalds had about $40 billion in sales in 2001. At the same time, PETA's 2001 budget was $13 million. How does a $13 million entity force a $40 billion entity to change behavior?

This problem goes beyond the McDonalds versus PETA example. All manner of activist groups with different agendas engage food companies every year. For example, Greenpeace protested Novartis/Gerber's apparent use of genetically modified soy products in baby foods after a promise to discontinue the practice (Greenpeace, 2001). As both Hoffman (2002) and Hammonds (2002) have pointed out, this engagement between activists and food companies is one of the most pervasive issues in the food industry today. However, little research has been conducted into the causes and consequences of activist demands on food companies. The growing level of engagement of food companies may be socially suboptimal inasmuch as activists likely represent the interests of only subsets of the population (Lusk, 2003) but yield disproportionate power to affect outcomes.

The objective of this study is to examine the strategic interaction between activists and food companies in general. A sequential bargaining game is utilized to describe the relationship between threats of protest, compliance offers, and decisions to protest in a framework of incomplete information. That is, the food company is not a priori aware of the seriousness or the ability of an activist to protest once the threat of protest has been made (alternatively, there is no meaningful information in the signal given by a threat of protest). This model provides insight into the optimal decisions when an activist should threaten protest and when the food company should comply, and therefore identifies critical areas of data needs and future study.

Conceptual Model

Game Description

We apply a stylized game theory model of sequential bargaining to the strategic interaction between food companies and activists. This model is adapted from a class of models of frivolous lawsuits (Rosenberg and Shavell, 1985; Bebchuk, 1984; Katz, 1990). Bebchuk is perhaps the most prominent example. However, Bebchuk's analysis considers only the defendant's (company's) decision to offer settlement, not the plaintiff's (activist's) decision to file suit. Clearly, the activist's decision of whether to engage a food company is also of interest. Ignoring this decision leads to two important limitations. First, it ignores the potential signal sent to the food company by the threat of protest by the activist (Katz, 1990). However, if it is costless to make threats, this consideration is not relevant. Second, the decision to make a threat of protest depends on the expectation about the food firm's decision to offer compliance.

Assume an activist group (or even an individual) has at least the potential of protesting a food company in an attempt to get the food company to change current behavior. Only the activist group knows whether it is serious about and/or capable of protesting

the food company a priori. In terms of capability, the activist must be able to inflict economic damage on the food company by protesting. For example, the activist is capable if it can secure advertising thorough contributions of members and if it has a grass-roots network of people willing to protest in different areas. Thus, the real question for the activist is whether it is serious about protesting. By contrast, a lone individual or ordinary consumer may be very serious about protesting, but incapable of inflicting economic damage on the food company. This distinction is a bit nebulous. However, consider that it is relatively easy for McDonalds to observe the financial resources of PETA, but it is not easy to determine whether PETA is willing to devote sufficient resources to any particular cause. Consequently, while inferences can be made about capability, an activist cannot reasonably protest every issue, so it is difficult to ascertain the activist's seriousness on any individual issue. For simplicity, from this point on, we assume the activist is capable of inflicting damage, and thus the question is the seriousness of the activist about attempting protest.

Assume the food company encounters a variety of activist groups, but does not know which of these groups is serious about protesting on a particular issue. It would be analogous to say that the food company is facing an individual activist group, but does not know its type. This formulation of the problem leads to a view that these encounters are a form of strategic interaction with incomplete information. The activist is attempting to change corporate behavior in a manner consistent with the activist's beliefs. The food company is attempting to formulate a strategy for reacting to these activists when the true intentions of the activist are unknown.[1]

The bargaining relationship has four sequential steps. First, the food company faces a random activist group, which is either serious or not serious (the state of nature) about inflicting economic damage through protests according to a commonly known probability distribution. Second, the activist chooses whether to threaten protest or not to threaten. This choice is dependent on if, and to what extent, the food company is willing to comply with the wishes of the activist and the size of economic damage caused to the food company if a protest ensues, thus endogenizing the activist's decision. Third, the food company will make a take-it-or-leave-it offer of compliance, which is the cost of the level of compliance the food company chooses to offer.[2] The food company cannot distinguish between a serious and non-serious activist. Finally, the activist chooses whether to accept the offer or to protest.

Definitions of Variables

The food company faces an activist with an unknown type, but a commonly known probability of being serious (figure 1).[3] Thus, the activist is of two types—serious and

---

[1] It is assumed there are no reputation effects here. The food company is encountering this activist for the "first time," or, more precisely, has limited information about the type of activist. We abstract from the dynamics of repeated interactions here for clarity in understanding the nature of the problem. However, we return to the implications of reputation effects later in the paper.

[2] Restricting this relationship to a single offer is a bit confining as the food company and the activist may negotiate to arrive at a final settlement. However, this simpler framework is more analytically tractable and provides sufficient detail for the problem.

[3] The presentation here is a bit non-standard for a game theory model. We present the model in this fashion to highlight the logical sequence of events in the context of the problem. A "condensed" version of the normal form game is presented in the appendix.

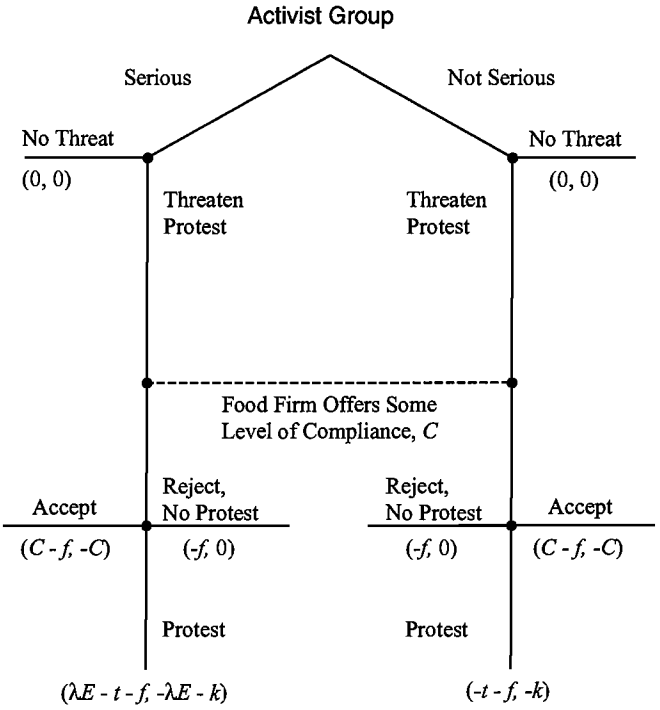

Figure 1. Sequential bargaining extensive form game, activist vs. food company

non-serious[4]—with the prior probability of being serious specified as: $p_0 \in [0, 1]$. The economic damage or lost sales that can be inflicted by a serious protestor is assumed to be equal to E. The activist is not interested in economic damage per se, but in animal welfare, for example, which has an economic or monetary value. For convenience, we assume the value of increased animal welfare to the activist is equal to E as well, although these two measures do not necessarily need to be equal.[5] The likelihood that the activist, through protesting, can inflict E on the food company is given by $\lambda \in (0, 1)$,[6] meaning the expected value of protest is λE. Because not all protests resonate with consumers, there is only some probability of success (λ) in inflicting some damage.

The cost of protest for the activist is t, and the cost of the food company defending itself with advertisements, etc., is k. Additionally, k can be thought of as lost brand equity, goodwill, etc., as a result of the protest. In either case, k is in addition to λE which arises from the protest with a probability 1. In addition to t, the activist has a cost, f, which is the cost of making the threat (e.g., some fixed costs of operation, mock

[4] It is possible to use a continuous distribution of types, but the results are qualitatively the same and the analytical model much more complicated.

[5] An assumption of inequality between the economic damage and the benefits to the activist of increased animal welfare has no real impact on the game. One can simply assume the utility of the activist is an increasing function of E. We abstract from that possibility here to maintain clarity of presentation.

[6] In reality, $\lambda \in [0, 1]$, so that λ can take on the limiting values of 0 or 1. However, if the food company is completely certain the activist cannot inflict any economic damage ($\lambda = 0$), or completely sure the activist will inflict economic damage ($\lambda = 1$), the decision of the firm is certain. Therefore, we are only interested in the cases where $0 < \lambda < 1$.

commercials that can be shown to food company officials). Once the threat is made, f is sunk and does not affect the decision of whether to protest.

The net expected gain, or payoff, to the activist for protesting if the activist is serious is $\lambda E - t$, while the net expected cost to the food company if the activist is serious and protests is $\lambda E + k$.[7] The activist chooses a strategy that maximizes its return (gain) from protest given the strategies of the food company. The food company attempts to minimize its expenditure given the activist's strategies and the food company's prior belief of whether the activist is serious (p_0). The payoffs to both the activist and the food company are shown in figure 1 (denoted by activist, food company).

Third-Stage Analysis

Optimal solutions in a sequential bargaining model are derived by reasoning backward from the end nodes in figure 1 to derive the Bayesian-Nash equilibrium strategies. In this case, the activist must choose between the food company's offer, C, or proceeding to protest the food company. A non-serious activist could obtain (a) some compliance level, C, by accepting the offer; (b) $-t$ by rejecting the offer and proceeding to protest; or (c) zero if the compliance offer is refused and the activist chooses not to protest. Likewise, a serious activist could obtain (a) some compliance level, C, by accepting the offer from the food company; (b) $\lambda E - t$ by rejecting the offer;[8] or (c) zero by rejecting the compliance offer and choosing not to protest.

Thus, the serious activist would only accept an offer C from the food company if $C \geq \lambda E - t$. When the serious activist is indifferent, it is assumed the serious activist would choose to accept the compliance offer. By contrast, a non-serious activist would accept any positive offer but would never actually protest. It follows that the food company will always offer either zero or $C^* = \lambda E - t$, depending on the food company's estimate (belief) of the probability the activist is serious—which can be established, for example, by the size of the activist's budget, how many issues in which the activist is currently engaged, or the dispersion/concentration and size of the activist's group membership.

Denote as p_1 the probability a protest will ensue, given that a threat has been made (or the posterior probability of seriousness). The value of p_1 depends on the prior probability of being serious (p_0) and the probability a non-serious activist will make a protest threat (q). Serious activists will always threaten protest because their payoff is at least $\lambda E - t - f$, which is strictly positive (if not, no party would ever threaten protest). By Bayes' rule, the posterior probability of seriousness (p_1) is designated by:

$$p_1 = \frac{p_0}{p_0 + (1 - p_0)q}, \tag{1}$$

where q, p_1, and p_0 all range from 0 to 1. As q moves from 0 to 1, the value of p_1 ranges from 1 to p_0. If there is no chance a non-serious activist would threaten protest ($q = 0$), then $p_1 = 1$, implying the food company is completely certain that the activist will protest.

---

[7] There may be some economic benefits to compliance, such as increases in brand equity. Here, this would only serve to reduce the compliance costs, C, or the expected economic damage from protest, $\lambda E + k$, but would not change the analytical results. If the economic benefits exceeded the costs of compliance, the company would simply choose to comply (or would implement the change prior to a threat of protest).

[8] Recall that f is sunk if a threat is made, so it affects total payoffs but does not affect the payoff if choosing between a compliance offer or protest.

This is an extreme case, however, and the outcome under such a scenario is not particularly interesting. Rather, we are interested in the cases where $0 < q < 1$.

Second-Stage Analysis

The food company, then, has the choice of offering C^* to all activists, or offering zero and being protested by only those activists who are serious. Given the cost of protest ($\lambda E + k$), the food company will strictly prefer to offer C^* if the expected cost of compliance ($\lambda E - t$) is less than the expected cost of enduring protest, $p_1(\lambda E + k)$. Rearranging this inequality and equating it at the margin yields the posterior probability threshold:

$$p_1^* = \frac{C^*}{\lambda E + k} = \frac{\lambda E - t}{\lambda E + k}. \tag{2}$$

If the posterior probability of seriousness (p_1) is less than the threshold value, the food company will prefer to allow the activist to protest. Alternatively, if the posterior probability is greater than the threshold, the food company will make a compliance offer, C^*. If the posterior probability and threshold are equal, the food company is indifferent.

Figure 2 shows the relationship between the magnitude of λ and the posterior probability threshold (p_1^*), holding the ratio of total protest costs to economic impacts constant [$(t + k)/E$ in figure 2). If the food company believes the probability that a protest will be successful is small (λ is small), the posterior probability threshold will be small. As the expected probability of protest success increases, the posterior probability increases as well. When the economic impacts of protest are large relative to total protest costs (0.25, for example, in figure 2), the threshold probability is larger given a value for λ than when the costs of protest become larger relative to economic impacts (0.33 and 0.50 in the figure) for the same value of λ. This result suggests the ratio of costs to economic impacts has an important role in the posterior probability in addition to the beliefs of the food company about the probability of a successful protest.

Given equation (2), the optimal strategies for the food company can now be defined by a single variable, ϕ, which denotes the probability that the food company will offer C^*. If $p_1 < p_1^*$, then $\phi = 0$. If $p_1 > p_1^*$, then $\phi = 1$. If the food company is indifferent ($p_1 = p_1^*$), ϕ can take on any value between 0 and 1. Examining the non-serious activist's decision regarding the threats to protest (q), the expected net return from protest is $\phi(\lambda E - t) - f$, because the activist must spend f to make the threat of protest and has ϕ probability of getting $\lambda E - t$ from the threat. Therefore, the threshold for the probability of an offer equal to C^* is:

$$\phi^* = \frac{f}{\lambda E - t}. \tag{3}$$

If $\phi > \phi^*$, the food company would be offering compliance at a probability higher than the optimal strategy. This choice makes threats of protest more attractive, and the non-serious activist would threaten protest with a probability $q = 1$ (or $p_0 = p_1$).[9] If the food company offers C^* with a probability less than ϕ^*, the probability of compliance offers would be lower than optimal. Thus, protest threats would not be attractive and

[9] The decision variable here is q. The impacts of the value of q on the posterior probability (p_1) are shown to illustrate the linkage between the probability of non-serious threats of protest and the posterior probability.

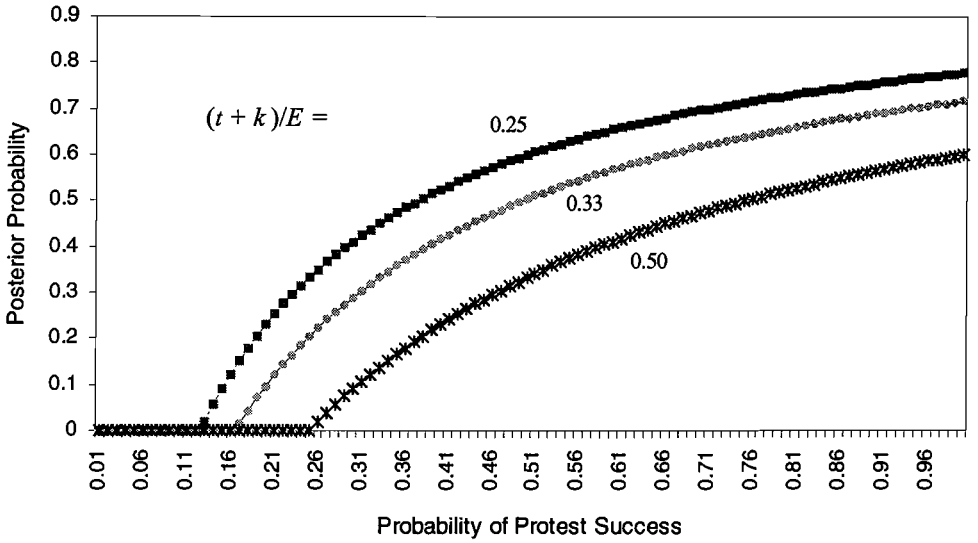

Figure 2. Posterior probability of seriousness across perceived probability of protest success (ratio of total protest cost to economic impact of protest held constant)

the non-serious activist would threaten protest with probability $q = 0$ (or $p_1 = 1$). Finally, if $\phi = \phi^*$, the non-serious activist would be indifferent to threats of protest and will choose any value of $q \in (0, 1)$, or $p_1 \in [p_0, 1]$.

Rearranging the definition for p_1^*, it can be shown that the threshold value for q is given by:

$$q^* = \frac{p_0(1 - p_1^*)}{(1 - p_0)p_1^*} = \frac{p_0(t + k)}{(1 - p_0)(\lambda E - t)}. \tag{4}$$

Equation (4) states that if non-serious activists threaten protests with a probability greater than q^*, the posterior probability of seriousness will be less than p_1^* and the food company would prefer to let the activist protest, and vice versa. Intuitively, this means that as the probability of a non-serious activist threatening protest exceeds the threshold value, the food company will perceive more non-serious activists than it is willing to tolerate, and will be less likely to make compliance offers.

First-Stage Analysis and Equilibrium

If the prior probability of being a serious activist is high ($p_0 > p_1^*$), the food company would strictly prefer to offer all activists C^*. Intuitively, this means that if the prior probability of being a serious activist is high (or the proportion of serious activists a food company faces is high), the food company would prefer to offer all activists C^* rather than face the high probability of protest. This choice reduces the almost certain loss of $t + k$ if the probability of seriousness is high. The perverse outcome of this equilibrium is that, given a high probability of seriousness, all non-serious activists would threaten protest and would earn a surplus (surplus in this context means the non-serious activist

receives a compliance offer, which is surely accepted, when the activist was unwilling to engage in a protest to achieve its goal). Specifically, in a world where most activists are serious, non-serious activists free-ride on the credible threats of serious activists and earn a rent equal to $\lambda E - t - f$.

The more interesting situation is when the prior probability is less than the threshold value. If $p_0 < p_1^*$, there is a unique Bayesian-Nash equilibrium whereby: (*a*) all serious activists will threaten protest; (*b*) some, but not all, non-serious activists will threaten protest; and (*c*) some non-serious activists will receive positive compliance offers while others drop their threats, and some serious activists fail to receive a compliance offer and are forced to protest.

Consider the separating equilibria if $p_0 < p_1^*$ and $\phi > \phi^*$. The return to threatening protest is strictly positive for the non-serious activist, giving an optimal response of $q = 1$ and $p_1 = p_0$. In this case, the food company's best response is $\phi = 0$, which cannot be an equilibrium because it contradicts the equilibrium strategy of the activist. Likewise, if $\phi < \phi^*$, the non-serious activist's return to threatening protest is strictly negative, so that this activist's best response is $q = 0$ and $p_1 = 1$. In this case, the food company's best response is $\phi = 1$, which cannot be an equilibrium because it contradicts the optimal activist strategy.

There is, however, a pooling equilibrium. Because the food company is indifferent about offering compliance when $p_1 = p_1^*$, and the non-serious activist is indifferent when $\phi = \phi^*$, these are the best responses to each other and therefore constitute a stable equilibrium. This equilibrium is stable under a dynamic adjustment process which mimics competitive behavior. If too many non-serious activists threaten protest, the food company will never offer compliance. Non-serious activists will exit the game until the food company is willing to comply with some positive probability. If too few non-serious activists threaten protest, the food company will always offer compliance. This will induce entry of non-serious activists until the food company is willing to allow some activists to protest without offering compliance.[10]

Comparative Statics

Posterior Probability

In equilibrium, the threshold proportion of activists who are serious (p_1^*) does not depend on the prior probability of seriousness (p_0) or the cost of making threats (f).[11] However, differentiating equation (2) with respect to expected payoffs (λE) yields:

$$\frac{\partial p_1^*}{\partial \lambda E} = \frac{1}{\lambda E + k} - \frac{\lambda E - t}{(\lambda E + k)^2} \geq 0, \tag{5}$$

suggesting that as the expected payoff increases, the threshold proportion of serious activists will increase as well (this result is supported by figure 2). If λE is viewed as

[10] If the prior probability (p_0) is exactly equal to the threshold value (p_1^*), a continuum of knife-edge equilibria exist, with ϕ taking on values in the interval $[\phi^*, 1]$. In all such equilibria, all potential non-serious activists will threaten protest because, if they did not, the food company would strictly prefer to offer compliance and threatening protest would be profitable.

[11] This is determined by taking the derivative of the threshold equation with respect to the stated variables.

the increase in animal welfare, for example, an increase in expected animal welfare decreases the relative importance of protest cost to the activist (i.e., λE becomes large relative to t). This, in turn, increases the required compliance level, C, to avoid protest. To illustrate, assume PETA perceives the benefit to animal welfare from expanding chicken pen size to be \$1 million. McDonalds offers a level of compliance that achieves some, but not all, of PETA's goals at a cost of \$50,000. Now, if the perceived benefits to animal welfare were to increase to \$100 million, would PETA be just as inclined to accept the \$50,000 offer?[12] Alternatively, increases in the expected payoff imply the food company must be more certain the activist is serious (p_1^*) before offering compliance. By analogy, if PETA claims it will protest if McDonalds does not implement a \$1 million improvement to pen size, would McDonalds' threshold probability of seriousness for that threat be the same as if the claimed costs were \$100 million assuming the same defense costs?

Differentiating equation (2) with respect to the activist's protest cost, t, yields:

$$\frac{\partial p_1^*}{\partial t} = -\frac{1}{\lambda E + k} < 0, \tag{6}$$

which implies higher protest costs lead to a smaller threshold probability of serious activists, and means serious activists will take lower offers of compliance in the beginning to avoid incurring the cost of protest. The intuition behind this finding is simple. If the cost of protest increases, the activist will be willing to accept a lower cost of compliance in the beginning. The food company will be more willing to offer a lower level of compliance, attracting more non-serious activists into the game. Thus, increasing protest costs attracts non-serious activists. Interestingly, this finding may explain why activist groups prefer to rely heavily on volunteers. Keeping protest costs low simultaneously deters entry of non-serious activists and increases equilibrium compliance offer amounts.

Likewise, differentiating equation (2) with respect to the food company's costs associated with protest, k, yields:

$$\frac{\partial p_1^*}{\partial k} = -\frac{\lambda E - t}{(\lambda E + k)^2} < 0, \tag{7}$$

suggesting an increase in the food company's expected cost of defending itself against protest will yield an increase in the proportion of non-serious activists (or decrease in the posterior threshold for compliance). The same logic applies here: the increased expected cost (k) makes enduring protest less palatable for the food company, thereby increasing the desire to initially offer compliance. This desire attracts more non-serious activists into the game. Thus, economizing on expected defense costs would deter entry of non-serious activists.

---

[12] There are, of course, extreme cases where the protestor will perceive the benefits to be infinite (lexicographic preferences), and will accept nothing short of the complete abolition of the corporate behavior (or corporate bankruptcy). We recognize this possibility, but do not explicitly address it in this paper.

Probability of Compliance Offers

The threshold value for a compliance offer (C^*, ϕ^*) does not depend on the prior probability of being serious or on the expected protest cost for the food company. However, differentiating ϕ^* with respect to protest cost of the activist yields:

$$\frac{\partial \phi^*}{\partial t} = \frac{f}{(\lambda E - t)^2} > 0, \tag{8}$$

indicating that increases in the protest cost of the serious activist will increase the probability of a compliance offer. An increase in protest costs decreases the attractiveness of protest to the serious activist, thereby lowering the required compliance offer from the food company to get the activist to accept. Differentiating ϕ^* with respect to the expected effect of protest, λE, yields:

$$\frac{\partial \phi^*}{\partial \lambda E} = -\frac{f}{(\lambda E - t)^2} < 0, \tag{9}$$

suggesting increases in the size of the expected effect of protest will decrease the threshold probability of a compliance offer. Increases in the expected impact of protest make protest more attractive, and therefore increase the probability of protest.

Shifting Costs

Suppose the food company requires proof of the activist's claim before a compliance offer is forthcoming (e.g., the food company requires the activist to provide proof that smaller pens actually damage the welfare of the chicken). The purpose of such a requirement would be to reduce incentives for non-serious activists to threaten protest. This requirement would be analogous to increasing the proportion of protest costs incurred prior to making a threat of protest (i.e., raising f and lowering t by the same amount). Based on the discussion above, raising f has no impact on the posterior probability of seriousness, but decreasing t increases the threshold probability of seriousness (p_1^*). The net result is a decrease in non-serious threats. Thus, an effective strategy for food companies is to require substantiation of the claims of the activist before making offers. The more of the cost that can be shifted to the activist, the more certain the food company is of the activist's seriousness. At the same time, a strategy by the activist would be to increase the amount of evidence provided a priori, leading to a greater probability of compliance offers.

Reputation Effects

The model above presents a general picture of the interrelationship between a potential activist and a food company, highlighting the trade-offs among the magnitude of economic costs for the food firm, protest costs, and the proportions of serious and non-serious activists. The model does not, however, consider reputation effects (or repeated games). For example, it is not likely reasonable to assume PETA's reputation had no impact on McDonalds' decision to comply. From the food company's perspective, reputation enters the calculation at two points. First, activists may develop a reputation for

always protesting for certain causes. In this case, the reputation of the activist for protesting enters the prior probability of an activist being serious (p_0), such that $p_0(r)$, where r is the reputation of the activist—i.e., the strength of the reputation influences the prior probability of seriousness.[13]

For example, assume an activist has a reputation for generally following through on threats of protest. In this case, the food company is reasonably sure the activist is serious, meaning p_0 is high. If p_0 is sufficiently high such that $p_0 > p_1^*$, the food company will always offer C^*. Thus, a reputation for protesting will always increase the probability of a compliance offer, other things equal. By contrast, a reputation for "bluffing" will lower p_0, whereby, other things equal, an activist who "bluffs" too often will be less likely to receive offers of compliance.[14]

Another means by which reputation can enter the problem is through the potential efficacy of protest, λ. Past history provides some indication of an activist's efficacy in protesting so that $\lambda(e)$, where e denotes efficacy, can be viewed as the impact of potential efficacy on λ. Thus, an activist with a reputation for being an effective protestor will likely generate a higher expected value of λ, consequently increasing the expected cost of protest for the food firm ($\lambda E + k$). Increases in the efficacy of the activist therefore increase the expected cost of protest, thereby increasing the probability of a compliance offer from the food firm.

Certainly, both forms of reputation effects can enter the decision-making process. However, they need not be mutually exclusive. For example, an activist may have a reputation for making false threats, but have a reputation for being highly successful when it does protest. This situation would complicate the process for the food firm. Nevertheless, intuition suggests there are dominant strategies activists could employ to preclude sending mixed signals. Activist groups would be best served by carefully selecting causes so that: (a) once a threat of protest is made, they are able to follow through with the protest if no compliance offer is extended, and (b) they have a plan to maximize the effectiveness of any protest activity.[15] Both of these strategies will maximize a compliance offer.

Discussion and Examples

The PETA/McDonalds scenario alluded to earlier provides an interesting context for this problem, both for the overall model structure as well as the dynamic issues related to the bargaining relationship. In 1999, PETA announced a publicity campaign, using bumper stickers, t-shirts, and billboards with a slaughtered cow's head associated with slogans such as "Do you want fries with that?" or "McDonalds: Cruelty to go" (Barisic, 1999). This "threat" was intended as a signal to McDonalds and represented an attempt

[13] There are polar cases where the activist has a reputation for never protesting or always protesting. The case where the activist does not protest is not particularly interesting because the food firm would never offer compliance. However, if an activist has a reputation for always protesting, the firm still has to decide whether to offer compliance based on the value of $\lambda E + k$, which is, at least in part, dependent on the probability of success of protest, λ.

[14] This latter point raises an interesting side issue of an equilibrium amount of "bluffing" on the part of the activist. While not developed here, it is reasonable to expect that activists would develop a sub-game solution for optimal bluffing to achieve their overall goals at the least cost.

[15] Part of the effectiveness of a protest relates to how the issue resonates with the consuming public. An activist may have an effective strategy for implementing a protest, but if no one in the public arena expresses any interest, the likely size of the economic damage (E) will be small.

to gain reforms in animal handling procedures. Spokespersons for McDonalds initially stated they believed the campaign to be tasteless and maintained it would not have the intended effect with consumers (seemingly indicating they thought the probability of protest success, λ, would be small). Shortly thereafter, however, McDonalds announced new standards for the treatment of laying hens (Mann, 2000).

While this issue may not seem logical at first, a closer examination adds some insight. Given that McDonalds offered compliance, then the previous model suggests the compliance offer (C^*) is equal to the expected impact of the protest ($\lambda E - t$). Assume the new requirements on laying hens increase egg costs by \$0.04/dozen (Smith, 2001), resulting in an annual increase in cost to McDonalds of \$10.5 million.[16] Also assume McDonalds estimates that a protest would result in a decrease in net income of 2%, or \$32 million. Given a protest cost of \$500,000 (the amount PETA spent on anti-cruelty activities in 2001), this means McDonalds only needs to perceive that PETA has a 32.8% chance at success with the protest to result in a compliance offer. Because the compliance costs were low relative to the expected impact of protest, McDonalds needed to perceive only a modest chance of success before agreeing to comply. Compare this to a situation where McDonalds anticipated that a protest would only decrease net income by 1%. Here, McDonalds would need to perceive PETA had a nearly 66% chance of success before compliance would be offered.

At the other extreme, Greenpeace (2001) threatened Novartis/Gerber with protest over the existence of genetically modified soybeans in their baby food. The cost of identity preservation and monitoring can be substantial and increase exponentially as tolerance levels become more stringent (Kalaitzandonakes, 2003), suggesting the expected impact of protest must be large to induce compliance. In this case, Novartis did not comply, resulting in a protest at the Novartis headquarters in Switzerland. Novartis ultimately agreed to investigate claims of contamination with genetically modified soy in baby food plants, but did not offer substantial compliance otherwise.

In terms of reputation effects, the PETA example above provides ample evidence of the effects of reputation. Immediately after the McDonalds engagement, PETA subsequently engaged Burger King and Wendy's, both of which altered behavior in a manner consistent with McDonalds. However, reputation serves to alter perceptions of the prior probability on the activist, but cannot completely override perceived cost considerations or perceptions of protest success, as may have been the case in the Greenpeace engagement.

These real-world cases do serve to highlight some potential strategies arising from the model. First, it is likely an activist would prefer to choose an issue where the compliance cost is relatively small compared to perceived economic costs of protest, so that the corporation would only need to perceive a small chance of protest success in order to offer compliance. This appears to be the strategy employed by PETA. By contrast, the potential compliance costs for Novartis were large. As the model predicts, increases in compliance costs result in a lower probability of a compliance offer. This finding suggests an optimal strategy by the activist for securing a compliance offer is to minimize the magnitude of compliance costs, which can likely be achieved by limiting the protest threat to a well-defined, small issue.

---

[16] This value is derived by assuming that each McDonalds in the United States (12,000 stores) sells, on average, 60 dozen eggs per day for 365 days at an added cost of \$0.04/dozen.

Conclusions

This paper presents a sequential bargaining game between activists and a corporate operator. The model focuses on the willingness or ability of an activist to follow through with a protest once a threat is made, and the corporation's optimal response to an activist with an unknown probability of protest once the threat of protest is made. The model demonstrates that there are situations when the corporate entity would always acquiesce to the demands of activists and activists would always protest. However, the model also shows there are conditions when some activists will make threats, but not follow through, and some situations when corporations will allow activists to protest without seriously offering to comply with their wishes. This model has the advantage of being able to document the strategic interaction between activists and corporations and arrive at a reasonable set of solutions which seem to mimic reality.

The results of the model suggest that, ceteris paribus, both increases in the cost of protest to the activist and the corporation will increase the probability of false threats from non-serious activists. By contrast, the probability of a false threat declines with increases in the expected payoff (protest impact or animal welfare increase). Thus, as the economic consequences of protest increase, we expect to see fewer false protest threats. Alternatively, as the cost of protest or defense increases, more non-serious activist groups are expected to emerge.

Increases in the cost of protest increase the likelihood a compliance offer will be made. However, this also means that the level of compliance to be achieved will be lower as well. At the same time, the probability of a compliance offer declines as the economic consequences of the protest (or improvements in animal welfare) increase. This finding may explain why companies are relatively accommodating when the economic consequences of compliance are relatively low, but become more resistant to compliance when the costs increase, even though the potential economic consequences of non-compliance increase as well.

Assume the actual animal welfare enhancements, for example, can be achieved so that losses to the corporation are gains by society. The existence of non-serious activists, however, has two economic costs. The first is the expected cost of non-credible threats by non-serious activists, qf. Second, there is the economic cost of protests which are required because, in equilibrium, some serious activists are not offered compliance and are forced to protest. Relaxing the assumption of correspondence between social value and cost complicates this issue significantly. Specifically, the social benefits of increased animal welfare may be concentrated on a relatively few animal rights advocates where the cost is borne by a broad consuming public. These distributional aspects are not addressed here.

We have also abstracted from the possibility that corporations may, in fact, receive economic benefits from compliance. This possibility does not change the structure of the game, however. Rather, this possibility opens the door for inclusion of these impacts into the corporation's optimal strategy.

Our model provides some indications of important data and analysis needs for empirical investigation of the costs and benefits of these activist engagements. First, some investigation into how and what issues activists choose to engage is needed. This research includes what issues are chosen and how these groups go about formulating their expected values of protest (i.e., how do they determine the value of the issue under question?). Second, how corporations assess both the probabilities of protest by activists and the likely economic impacts of protest need attention. Finally, the distribution of

benefits and costs of protest require examination. While public policy is not likely to intervene on the freedom of speech of protestors, knowledge of the distributional impacts of these activities is necessary to understand how these impacts will shape the future of our food distribution system.

Future research may explore two potential routes of inquiry. First, the comparative statics arising from the model could be tested experimentally. An experimenter could devise a bargaining game where payoffs were established based on the structure of the game. To introduce uncertainty (especially the probabilities of successful protest), a lottery could be used to determine the final outcome of the protest should that be the choice of the respondents. Alternatively, a meta-analysis of news stories on activist-corporate engagement could be used to establish the marginal effects of activist size, budget, etc., and the expected economic impact of compliance/non-compliance on the probabilities of protest/compliance. While this latter approach is more indirect relative to the conceptual model, it would provide evidence as to the appropriateness of the theoretical model predictions and variables of interest.

[*Received May 2003; final revision received September 2003.*]

References

Ayers, E. "When Corporations Can't Rule the World." *World Watch* 13(2000):3–5.

Barisic, S. "Animal Rights Group Preparing Campaign Against McDonalds." Associated Press Wire Service, 7 September 1999.

Bebchuk, L. "Litigation and Settlement Under Imperfect Information." *RAND J. Econ.* 15(1984): 404–415.

Belsie, L. "The Rise of Corporate Apology." *Christian Science Monitor* 92, no. 204(2000):1.

Cook, K. "Natural Capitalism." *Village Voice* 45,29(2000):54.

Friedman, M. "Consumer Boycotts in the United States, 1970–1980: Contemporary Events in Historical Perspective." *J. Consumer Affairs* 19(1985):96–117.

Gillan, S., and L. Starks. "Corporate Governance Proposals and Shareholder Activism: The Role of Institutional Investors." *J. Finan. Econ.* 57(2000):275–306.

Greenpeace. "Novartis Buckles as Greenpeace Reveals GM Soya in Its Products." Greenpeace press release, 21 August 2001. Online at Greenpeace website, http://www.greenpeace.org/~geneng/highlights/food/Aug21_2001.html.

Hammonds, T. "Adventures of an Agricultural Economist in Washington." Keynote Address, American Agricultural Economics Association Annual Meeting, Long Beach, CA, July 2002.

Hoffman, G. "Supply Chain Management in Foods: The Case of Burger King." Owen Cooper Cooperative Lecture, Mississippi State University, February 2002.

Kalaitzandonakes, N. "The Economics of Thresholds in IP Systems: An Example from the U.S. Seed Industry." Paper presented to the Product Differentiation and Market Segmentation in Grains and Oilseeds Conference, Washington, DC, 27–28 January 2003.

Kang, D. "The Impact of Activist Institutional Investors on Performance in Public Corporations: A Study of the U.S. Fortune 500, 1982–1994." In *Academy of Management Proceedings*, pp. 1–7, 2000.

Kapstein, E. "The Corporate Ethics Crusade." *Foreign Affairs* 80(2001):105–119.

Katz, A. "The Effect of Frivolous Lawsuits on the Settlement of Litigation." *Internat. Rev. Law and Econ.* 10(1990):3–27.

Lohmann, S. "Information versus Manipulation: A Signalling Theory of Political Action." Research Rep. No. 1131, Stanford Graduate School of Business, Stanford, CA, April 1991.

Lusk, J. "Do NGOs Represent the Public? Consumer Preferences for GM Foods in the U.S. and E.U." Organized Symposia Presentation, American Agricultural Economics Association Annual Meeting, Montreal, Canada, 27–29 July 2003.

Mann, J. "Animal Rights Group Targets Overland Park, KS, Eatery, Other Restaurants." *The Kansas City Star* (30 November 2000).

Rosenberg, D., and S. Shavell. "A Model in Which Suits Are Brought for Their Nuisance Value." *Internat. Rev. Law and Econ.* 5(1985):3–13.

Shepard, J., M. Betz, and L. O'Connell. "The Proactive Corporation: Its Nature and Causes." *J. Bus. Ethics* 16(1997):1001–1011.

Smith, R. "Bird Cage Space Called Hardest of Hen Welfare Needs to Evaluate." *Feedstuffs* 73,11(2001). Online. Available at http://www.feedstuffs.com/feed/printerFriendlyVersion/1,1978,6949,00.html.

Appendix: "Condensed" Version of the Normal Form Game

In the game between the activist and the food company, there are two types of activists—serious and non-serious—denoted by the subscript $i \in \{s, n\}$. The strategy of the activist is given by the triplet (q_i, r_i, y_i), where q_i is the probability of threatening protest (at a cost f), r_i is the probability of accepting a compliance offer from the food company of $C^* = \lambda E - t$, and y_i is the probability of accepting zero from the food company. The strategy of the firm is denoted by ϕ, which represents the probability of offering a compliance offer equal to C^*, and the probability of offering zero is given by $(1 - \phi)$.

Reasoning backward from the end nodes in text figure 1 (third-stage analysis), both the serious and non-serious activist would accept a compliance offer of C^*, so that $r_i = 1$ for both types of activists. If no compliance was offered by the food company ($\phi = 0$), the non-serious activist would always choose to accept the zero offer and not protest (or $y_n = 1$). However, the serious activist could always receive positive benefit from protest (or $\lambda E - t - f$), and would therefore reject the zero offer and proceed to protest (or $y_s = 0$).

In the second stage, note that indifference of the firm between offering and not offering compliance is given by:

$$p_1^* = \frac{\lambda E - t}{\lambda E + k}. \tag{A1}$$

Given that p_0 is the firm's prior belief that an activist is serious, and given that non-serious activists will threaten protest with probability q_n, the posterior probability of a serious activist for the firm following Bayes' rule is:

$$p_1 = \frac{p_0}{p_0 + (1 - p_0)q_n}. \tag{A2}$$

Given (A2), the firm's indifference can be rewritten as:

$$(\lambda E - t) = (\lambda E + k)\left(\frac{p_0}{p_0 + (1 - p_0)q_n}\right). \tag{A3}$$

If $p_0 = 1$, or if $q_n = 0$, the firm is not indifferent, and therefore would offer compliance with $\phi = 1$. This cannot be an equilibrium because if the firm always offers compliance, it will attract non-serious activists to threaten protest. If, however, $p_0 = 0$, the firm is not indifferent and would offer compliance with $\phi = 0$. This cannot be an equilibrium either, because all serious activists would protest. Thus, the only equilibrium is where $\phi \in (0, 1)$. This depends on the choice of the non-serious activist being indifferent between threatening and not threatening protest, or $q_n \in (0, 1)$, which requires:

$$\phi(\lambda E - t - f) + (1 - \phi)(-f) = 0. \tag{A4}$$

For (A4) to be true, ϕ must be strictly between 0 and 1. Thus, the equilibrium found above satisfies this condition. We conclude, therefore, that in equilibrium: (*a*) all serious activists will threaten protest; (*b*) some, but not all, non-serious activists will threaten protest; (*c*) some, but not all, serious activists will receive a compliance offer while some will protest; and (*d*) some non-serious activists will receive compliance offers.