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CSR AS A SIGNAL TO INFORM COLLECTIVE ACTION

Dionisia Tzavara

EUROPEAN UNIVERSITY INSTITUTE, FLORENCE
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Abstract

Collective action in the form of a boycott or a campaign or any other threat that affects the operations of a firm is considered an instrument in the hands of organizations and consumers to control firm behaviour and to apply pressure on firms to behave in a socially responsible manner. This paper adds to existing literature on collective action in the context of CSR by looking at firms' incentives to signal their true technology through the choice of CSR in order to avoid collective action of a higher magnitude than that corresponding to their true type of technology. It is shown that collective action does not always succeed to provide incentives to firms to engage in CSR and finds conditions for collective action to be successful.

Keywords

Signalling, collective action, Corporate Social Responsibility

1. Introduction

As the public call for Corporate Social Responsibility (CSR) is increasingly persistent, firms make an effort to demonstrate their engagement with society and the environment by adopting practices that we can put under the CSR umbrella. Corporate Social Responsibility is defined and understood as a voluntary engagement. In fact the European Commission (2007, p. 5) defines CSR as "a concept whereby companies integrate social and environmental concerns in their business operation and in their interactions with stakeholders on a voluntary basis". However, CSR is a costly engagement and thus the question that arises is, "is CSR incentive compatible?". In other words, why do firms adopt practices that we can call CSR and more importantly are private incentives enough for firms to meet public expectations about CSR?

At the centre of the discussion about CSR is the question of private incentives. As it is argued in the literature "CSR can be more than a cost, a constraint or a charitable deed – it can be a source of opportunity, innovation and competitive advantage" (Porter and Kramer, 2006, p. 3). So there is a part of the literature, which argues that CSR enhances firm reputation and brand name, it enhances relations with stakeholders and suppliers, it allows the firm to manage its resources more efficiently and effectively. One other part of the literature argues that firms resort to CSR in an effort to pre-empt or avoid formal regulation (Maxwell et al, 2000; Maxwell and Decker, 2001, Decker, 2003), and costly litigation (Levis, 2006; Kolk et at, 1999; Shamir, 2004; Tzavara, 2008). Bagnoli and Watts (2003) analyze the choice of firms to provide what they call a public good with the aim to boost the sales of their private good and find that competition for socially responsible consumers induces firms to produce the public good. Arora and Gangopsdhyay (1995) examine how the existence of consumers who have a preference for environmentally friendly produced goods can induce firms to overcomply with environmental standards. Feddersen and Gilligan (2001) examine how the presence of an activist who provides information about a credence good to consumers who value environmentally friendly production can affect the choices of consumers and thus the behaviour of firms towards environmentally friendly production.

Collective action in the form of a boycott or a campaign or any other form of threat which can affect the operations of the firm is considered as in instrument in the hands of organizations and consumers who wish to apply pressure on firms to behave in a socially responsible manner. So for example Baron (2001) examines the effectiveness of collective action in "chang[ing] the production practices of a firm for the purpose of redistribution to those whose interests it supports" (p. 7). He finds that the threat of a boycott can make the firm adopt a "strategic" as he calls it CSR. He also finds that a condition for boycotts to arise in equilibrium is asymmetric information. Similarly Innes (2006) analyzes a game between duopolists and an environmental organization which threatens the firms with a boycott against products which are not produced with an environmentally friendly technology. Innes analyzes the conditions under which a boycott will arise in equilibrium, given the firms' choices of what he calls a "green" (environmentally friendly) or a "brown" (environmentally harmful) technology. Delacote (2006) examines the success of consumer boycotts and the reasons why boycotts are unsuccessful. He looks at the issues of free-riding and coordination and argues that even in the absence of the problems of free-riding and coordination boycotts may fail depending on the ability of the boycotting group to pressure the firm enough to change its actions.

There has been only limited research examining the use or the effectiveness of CSR as a signal and how this can induce firms to engage in CSR. Rahman (forthcoming) considers CSR as a signal towards consumers of the firm's brand value, in a model where firms choose to engage in CSR in order to give consumers the signal that their profitability is high enough that they can "burn" money in CSR, to use the author's expression. The author considers two types of firms, profitable firms and firms which only break even and shows that profitable firms will use CSR as a signal of their profitability only if CSR is a signal which is too costly for break-even firms. Goyal (2005) models CSR as a

signalling device in the context of FDI, in a model where investment in CSR signals firms' commitment to long term presence in the host country. The author examines how assuming differences in the way firms discount the future results in them investing in CSR in equilibrium.

This paper would like to combine the literature on collective action as means to pressure firms to practice CSR with models of signalling. More specifically, the research would like to look at firms' incentives to signal their true technology through the choice of CSR in order to avoid collective action, or more precisely to avoid collective action of a higher magnitude than that corresponding to the type of technology of the respective firm. For this purpose the paper develops a signalling model according to Spence (1973). The model assumes a firm producing a good with a technology which causes a certain level of pollution to the environment. The technology meets minimum legal/regulatory requirements, but in the market there exists an activist group which does not like pollution and launches collective action against the operations of the firm depending on expectations about the firm's technology. It is shown that, collective action is successful in providing incentives for the firms to engage in CSR only in half of the contingencies that can arise. What determines the success of collective action and the choice of firms to be socially responsible is the cost of CSR was well as the gains from changing the firm's signal from no CSR to CSR.

The paper differs from the above presented literature on collective action in several respects. One such aspect is that it is not interested in examining the choices of the activist group with respect to launching or not the collective action. For this reason an investment cost in collective action is not included. Also, the paper does not examine the conditions under which collective action arises in equilibrium, as it is assumed that collective action is launched but the magnitude is dependent on expectations about technology. The paper aims to examine the firms' incentives to invest in CSR in order to reveal the true impact of their technology to the environment and be faced with collective action relative to their true technology. So CSR is considered as a signalling device that informs the activist group about true technology and thus its true impact on the environment. Note that while the paper discusses polluting technology and its impact on the environment the analysis could also apply to other forms of social engagement. Also, the paper differs from the above presented literature on collective action in the sense that CSR does not change the firm's technology. So the firm may decide to engage in CSR that does not affect its technology but contributes in some way to society or the environment. In other words the outcome of collective action when that is successful in inducing the firm to be socially responsible is not a direct change to the operations of the firm but a contribution of the firm to the environment or society, some kind of "giving back" to society or the environment. This paper aims to contribute to the debate about the incentive compatibility and effectiveness of CSR as an instrument to control firm behaviour and to sustain social and environmental considerations from the side of firms.

2. The model

Consider a market with a demand function for a certain product given by $p = a - bq$ and a firm which operates in the market and can be one of two types with respect to its polluting technology, it can either be a heavily polluting firm with technology t_H or a lightly polluting firm with technology t_L, where it is assumed that $t_H > t_L$. For the rest of the paper the heavily polluting type will be called the inefficient type and the lightly polluting type will be called the efficient type. It is assumed that it is equally likely that the firm has either of the two technologies, so that $pr(t_H) = pr(t_L) = 1/2$. In the market there exists an activist group which does not like the effects of pollution and which takes collective action against polluting firms. As discussed earlier, collective action can be in the form of a boycott, a campaign, or any other form of action which can affect the operations of the firm, in a way that will be discussed below. It is assumed that the activist group cannot observe the type of the firm (inefficient or efficient) but knows that it is equally likely that the firm is one of the two types and uses its expectation about pollution to initiate the collective action. The firm knows its type and can choose

to send a signal to the activist group through investing in CSR. The activist group then observes the signal and updates its expectation about the technology of the firm.

The timing of the game is the following. The technology of the firm is randomly chosen, and it is assumed that it is equally likely that the firm is of one of the two types. The firm observes its type and chooses the level of CSR. It is assumed that there are only two choices of CSR, $r = 1$ or $r = 0$, so that the firm can choose to either fully invest on CSR or not invest at all. The activist group observes the signal in the form of investment in CSR and updates its expectation that the firm is of the efficient type to $q_1 = \mu(t_H / r)$ (so that, given the signal, the firm is of the inefficient type with a probability $1 - q_1 = 1 - \mu(t_L / r)$). Given this expectation the activist group chooses the collective action against the firm. Following Baron (2001), it is assumed that the effect of collective action takes the form of a downward shift to the demand of the firm of the magnitude $g(r)$ so that inverse demand becomes $p = a - bq - g(r)$, where $g(r) = g(0)$ when the signal is $r = 0$ and $g(r) = g(1)$ when the signal is $r = 1$. Given the magnitude of collective action, the firm chooses the level of output and the two parties resume payoffs.

Payoffs are as follows. For the firm it is assumed that payoffs are given by profits net of the cost of the signal $\pi(p,q) - c(t,r)$, where $\pi(p,q) = [a - bq - g(r)]q$ is the firm's profit net of the investment costs of CSR, where it is assumed that the firm has no production costs[1], and $c(t,r) = \alpha t r$ is the cost of investing r in CSR when the firm is of type t with α being a constant parameter specifying the cost intensiveness of the investment. The firm chooses the level of output to maximize profits. So output is given by

$$q^*(r) = \frac{a - g(r)}{2b} \tag{1}$$

the price for the product is given by

$$p^*(r) = \frac{a - g(r)}{2} \tag{2}$$

and thus profit is given by

$$\pi^*(r) = \frac{[a - g(r)]^2}{4b} \tag{3}$$

For the activist group the following assumptions are made. The activist group gets a disutility from pollution which is given by $\psi(t)$ such that $\psi'(t) > 0$ and $\psi''(t) > 0$, so that a more polluting technology increases disutility at an increasing rate. It is assumed that the benefit of the boycott for the activist group derives from the fact that less output is produced with a polluting technology and thus is assumed to be exactly equal to the shift in demand that is caused by $g(r)$, the magnitude of the boycott. As a result the utility of the activist group is given by $U = g(r) - \psi(t)$, where as discussed in the introduction, it is assumed that the boycott is costless for the activist group, it does not require any investment[2]. This assumption is made with the aim to maintain simplicity in presentation and calculations as this research does not aim to look at issues such as optimal choice of investment in collective action or issues of coordination among members of the activist group but rather at the effect of the boycott on the choice of the firm.

At this point it is important to note that the cost of a signal is higher for the inefficient type than for the efficient type, $c(t_H, r) = \alpha t_H r > \alpha t_L r = c(t_L, r)$. This can be for a number of reasons, such as for example corporate culture. The inefficient type may have a corporate culture which is in general negligent about social issues and thus it may be more costly to adopt a practice that can be put under

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1 This assumption is only made to maintain simplicity and does not alter qualitatively the results.

2 Note that the activist's utility function is simpler than the one used in Baron (2001) exactly because this paper is not interested in examining the optimal level of boycott investment and does not consider the firm's option of contesting the boycott as in Baron.

the label of CSR. Alternatively it may be that the technology of the inefficient type implies that higher cost needs to be incurred so that the investment in CSR is in good fit with this type's technology.

Finally, it is assumed that the activist group updates its expectation that the firm is an efficient type according to Bayes' rule, so that

$$q_1(r) = \mu(t_L / r) = \frac{pr(r/t_L)\,pr(t_L)}{pr(r)} = \frac{pr(r/t_L)\,pr(t_L)}{pr(r/t_L)\,pr(t_L) + pr(r/t_H)\,pr(t_H)} \tag{4}$$

which given the assumption of equal likelihood for the two types of firms is reduced to

$$q_1(r) = \frac{pr(r/t_L)}{pr(r/t_L) + pr(r/t_H)} \tag{5}$$

In this signalling game the participants are faced with two types of constraints, participation constraints, which will guarantee the participation of the two parties, and incentive compatibility constraints, which will guarantee that the parties' actions are in accordance with their incentives. Starting from participation constraints, for the activist group to be willing to play the game described above, it must be that its expected payoff from the game is at least non-negative, $E(g(r) - \psi(t)) \geq 0$. Similarly for the firm to be willing to play the game it must be that its expected payoff from the game is at least non-negative, $E(\pi(p,q) - c(t,r)) \geq 0$. Again for the reasons discussed in the introduction, and given that collective action is costless, it is assumed that the activist group wishes only to break even, in other words it chooses to expend all its satisfaction from reducing the production of the polluting good to compensate for the disutility caused from the production of the good.

In what follows it will be shown that there exist three types of equilibria, one separating where the inefficient type chooses no CSR and the efficient type chooses full CSR and two polling equilibria where both firms choose to send the same signal to the activist group, either no CSR or full CSR. It will also be shown that it never pays for the inefficient type to give a signal of full CSR when the efficient type chooses to give the signal of no CSR (so that a separating equilibrium where the inefficient type chooses full CSR and the efficient type chooses no CSR, does not exist).

2.1 Separating equilibrium with the heavy polluter choosing no CSR

A separating equilibrium with the inefficient type sending the signal $r = 0$ and the efficient type sending the signal $r = 1$ means that it is always best for the inefficient type to choose this signal and also the for the efficient type. As a result whenever the activist group observes a signal $r = 0$, it updates it's expectation that the firm is an efficient type to

$$q_1(0) = \frac{pr(0/t_L)}{pr(0/t_L) + pr(0/t_H)} = 0 \tag{6}$$

while whenever the activist group observes a signal $r = 1$, it updates it's expectation that the firm is an efficient type to

$$q_1(0) = \frac{pr(1/t_L)}{pr(1/t_L) + pr(1/t_H)} = 1 \tag{7}$$

so that the activist group knows with certainty which kind of firm it is faced with. In this case the activist group launches collective action of magnitude $g(1) = \psi(t_L)$ if the signal is $r = 1$ and launches collective action of magnitude $g(0) = \psi(t_H)$ if the signal is $r = 0$.

Let's turn now to the incentive compatibility constraints for the two types of firm. Looking at the costs of the signal, if any of the two types chooses the signal $r=0$ then it will cost the firm $c(t,0)=0$, while if any of the two types chooses the signal $r=1$ then it will cost the firm $c(t,1)=\alpha t$. As a result incentive compatibility for the inefficient type requires that

$$IC_H: \quad \frac{[a-g(0)]^2}{4b}-0>\frac{[a-g(1)]^2}{4b}-\alpha t_H \tag{8}$$

while incentive compatibility for the efficient type requires that

$$IC_L: \quad \frac{[a-g(1)]^2}{4b}-\alpha t_L>\frac{[a-g(0)]^2}{4b}-0 \tag{9}$$

Note now that if the inefficient type's participation constraint is satisfied, so that the inefficient type earns non negative profits, then combining the inefficient type's participation constraint with the efficient type's incentive compatibility constraint yields the efficient type's participation constraint. So the conditions for this type of equilibrium to exist derive from the two individual rationality constraints, which we can write as

$$IC_H: \quad \alpha t_H>\frac{[a-g(1)]^2}{4b}-\frac{[a-g(0)]^2}{4b} \tag{10}$$

and

$$IC_L: \quad \frac{[a-g(1)]^2}{4b}-\frac{[a-g(0)]^2}{4b}>\alpha t_L \tag{11}$$

and combine to

$$\alpha t_H>\frac{[a-g(1)]^2}{4b}-\frac{[a-g(0)]^2}{4b}>\alpha t_L \tag{12}$$

What this condition says is that the cost of sending the signal $r=1$ for the inefficient type must be substantially higher than for the efficient type. In particular the distance between the costs of the signal $r=1$ for the two types must exceed the gain in profits from changing the signal from $r=0$ to $r=1$. If this condition is satisfied, then the two firms will choose to send different signals and the activist group will update its expectation accordingly and launch the appropriate collective action according to the technology of the firm.

2.2 Pooling equilibrium with both types choosing no CSR

A pooling equilibrium with both types sending the signal $r=0$ means that it is always best for the inefficient type to choose this signal and also the for the efficient type. As a result whenever the activist group observes a signal $r=0$, it updates it's expectation that the firm is an efficient type according to

$$q_1(0)=\frac{pr(0/t_L)}{pr(0/t_L)+pr(0/t_H)}=\frac{1}{2} \tag{13}$$

In other words in this case the signal gives no additional information to the activist group, which continues to have the same expectation about the type of the firm as before the signal. As a result whenever the activist group observes $r=0$ it launches collective action of magnitude

$g(0)=\frac{1}{2}\psi(t_L)+\frac{1}{2}\psi(t_H)$ while in the event that the signal is $r=1$ then collective action is of magnitude $g(1)=\psi(t_L)$.

Looking at the incentive compatibility constraints for the two types of firm, incentive compatibility for the inefficient type requires that

$$IC_H: \quad \frac{[a-g(0)]^2}{4b} > \frac{[a-g(1)]^2}{4b} - \alpha t_H \tag{14}$$

while incentive compatibility for the efficient type requires that

$$IC_L: \quad \frac{[a-g(0)]^2}{4b} > \frac{[a-g(1)]^2}{4b} - \alpha t_L \tag{15}$$

Again for the same reasons as above, the conditions for this type of equilibrium to exist derive from the two individual rationality constraints, which we can write as

$$IC_H: \quad \alpha t_H > \frac{[a-g(1)]^2}{4b} - \frac{[a-g(0)]^2}{4b} \tag{16}$$

and

$$IC_L: \quad \alpha t_L > \frac{[a-g(1)]^2}{4b} - \frac{[a-g(0)]^2}{4b} \tag{17}$$

which given that $\alpha t_H > \alpha t_L$ imply that so long as the incentive compatibility constraint of the efficient type is satisfied

$$\alpha t_L > \frac{[a-g(1)]^2}{4b} - \frac{[a-g(0)]^2}{4b} \tag{18}$$

there will be a pooling equilibrium where both types will prefer not to engage in CSR and let the activist group base its collective action on its expectation about the level of pollution without updating its expectation. What the condition says is that so long as the cost of sending the signal $r=0$ for the efficient type exceeds the gain in profits from changing the signal from $r=0$ to $r=1$, the equilibrium will be a pooling equilibrium with both types choosing no CSR.

2.3 Pooling equilibrium with both types choosing full CSR

A pooling equilibrium with both types sending the signal $r=1$ means that it is always best for the inefficient type to choose this signal and also the for the efficient type. As a result whenever the activist group observes a signal $r=1$, it updates it's expectation that the firm is an efficient type according to

$$q_1(1)=\frac{pr(1/t_L)}{pr(1/t_L)+pr(1/t_H)}=\frac{1}{2} \tag{19}$$

In other words in this case the signal gives no additional information to the activist groups which continues to have the same expectation about the type of the firm as before the signal. As a result roup observes $r=1$ it launches collective action of magnitude $g(0)=\frac{1}{2}\psi(t_L)+\frac{1}{2}\psi(t_H)$ while in the event that the signal is $r=0$ then collective action is of magnitude $g(0)=\psi(t_H)$.

Looking at the incentive compatibility constraints for the two types of firm, incentive compatibility for the inefficient type requires that

$$IC_H: \quad \frac{[a-g(1)]^2}{4b} - \alpha t_H > \frac{[a-g(0)]^2}{4b} \tag{20}$$

while incentive compatibility for the efficient type requires that

$$IC_L: \quad \frac{[a-g(1)]^2}{4b} - \alpha t_L > \frac{[a-g(0)]^2}{4b} \tag{21}$$

Again for the same reasons as above, the conditions for this type of equilibrium to exist derive from the two individual rationality constraints, which we can write as

$$IC_H: \quad \frac{[a-g(1)]^2}{4b} - \frac{[a-g(0)]^2}{4b} > \alpha t_H \tag{22}$$

and

$$IC_L: \quad \frac{[a-g(1)]^2}{4b} - \frac{[a-g(0)]^2}{4b} > \alpha t_L \tag{23}$$

which given that $\alpha t_H > \alpha t_L$ imply that so long as the incentive compatibility constraint of the inefficient type is satisfied

$$\frac{[a-g(1)]^2}{4b} - \frac{[a-g(0)]^2}{4b} > \alpha t_H \tag{24}$$

there will be a pooling equilibrium where both types will prefer to engage in full CSR and let the activist group base its collective action on its expectation about the level of pollution without updating this expectation. What the condition says is that so long as the gain in profits from changing the signal from $r=0$ to $r=1$ exceeds the cost of sending the signal $r=1$ for the inefficient type, the equilibrium will be a pooling equilibrium with both types choosing full CSR.

2.4 Separating equilibrium with the heavy polluter choosing full CSR

A separating equilibrium with the inefficient type sending the signal $r=1$ and the efficient type sending the signal $r=0$ cannot exist. In order to have this type of equilibrium it must be that the inefficient type always chooses this signal and also the efficient type. As a result whenever the activist group observes a signal $r=0$, it updates it's expectation that the firm is an efficient type according to

$$q_1(0) = \frac{pr(0/t_L)}{pr(0/t_L) + pr(0/t_H)} = 1 \tag{25}$$

while whenever the activist group observes a signal $r=1$, it updates it's expectation that the firm is a efficient type according to

$$q_1(1) = \frac{pr(1/t_L)}{pr(1/t_L) + pr(1/t_H)} = 0 \tag{26}$$

so that the activist group knows with certainty which kind of firm it is faced with. In this case the activist group launches collective action of magnitude $g(1) = \psi(t_H)$ if the signal is $r = 1$ and launches collective action of magnitude $g(0) = \psi(t_L)$ if the signal is $r = 0$.

Looking at the incentive compatibility constraints, incentive compatibility for the inefficient type requires that

$$IC_H: \quad \frac{[a - g(1)]^2}{4b} - \alpha t_H > \frac{[a - g(0)]^2}{4b} \tag{27}$$

while incentive compatibility for the efficient type requires that

$$IC_L: \quad \frac{[a - g(0)]^2}{4b} > \frac{[a - g(1)]^2}{4b} - \alpha t_L \tag{28}$$

Note now that the incentive compatibility constraint for the inefficient type can be written as

$$\frac{[a - g(1)]^2}{4b} - \frac{[a - g(0)]^2}{4b} > \alpha t_H \tag{29}$$

and given that $g(1) = \psi(t_H) > \psi(t_L) = g(0)$ the above implies that $0 > \alpha t_H$ which is not true. So even when the incentive compatibility constraint of the efficient type can be satisfied, it will not be incentive compatible for the inefficient type firm to send the signal $r = 1$, when the efficient type sends the signal $r = 0$.

3. Discussion and conclusions

It is in fact the case that firms try to convey messages about their commitment to society or the environment through their engagement in CSR. For example, through investing in the betterment of local societies, oil companies (and indeed not only those) try to confer the signal that they are interested in the well-being of local societies and thus would do their best to impose negative externalities of the minimum possible impact. Another example is food producers who market their products under the label of "locally produced" again for the well-being of local societies, trying also to convey the signal that the products are made with additional care in terms for example of production processes or use of materials. At the same time it seems to be a fact that the signals sent by firms through their CSR engagement are perceived to convey certain messages. For example according to a survey conducted by the Co-operative Bank (2007, p.3) on UK consumers, a significant number of consumers avoid to purchase budget clothes as low cost is taken "as a likely indicator of poor supplier conditions". These observations make the study of CSR as a signal both relevant and interesting.

This paper uses a model a signalling to examine the effectiveness of collective action in providing incentives for firms to engage in CSR. It builds upon existing literature on collective action and incentives for CSR and extends the literature in that it treats CSR as a signalling device rather than as an action that improves the firms' technology. CSR is used as a signal to an activist group in order for the activist group to update its expectation about the firm's technology and launch collective action of the relevant magnitude.

It is shown that collective action succeeds in only half of the contingencies that can arise to provide incentives for the firms to engage in CSR. The success of collective action depends on the gains for the firm from changing its signal from no CSR to full CSR and on the cost of investing in full CSR. It is shown that there are more contingencies where the firm with the least polluting technology chooses to invest in CSR, as it costs less to the efficient type to send the full CSR signal. As a direct result, there are fewer contingencies where the heavily polluting firm is induced to be socially responsible, as

the cost of CSR is higher for this type of firm. The fact that in the model collective action succeeds to provide incentives for CSR in only half of the contingencies raises concerns for the effectiveness of collective action as an instrument of pressure against irresponsible corporate behaviour.

Naturally, with specific functional forms for the activist group's benefit from collective action as well as disutility from pollution more can be said about the range in which collective action will be successful in providing incentives for CSR. So one extension of the model presented above is to identify the properties of specific functions for the benefit from collective action as well as the disutility from pollution, with the aim to see whether more can be said about the specific gains in profit and the specific technologies which will induce CSR. This suggests that empirical research about those functions will be required to inform further research.

Other extensions of the model can be made by changing the assumptions of the model. For example, in the model presented above, collective action is always launched. So it would be interesting to see how uncertainty about the launching of collective action affects the outcome of the signalling game. Similarly, the market of the model is a market of one firm, so it would be interesting to add competition to the model and see how this affects the outcome of collective action. Finally, it would be interesting to see how the model changes if CSR from the side of the firm has an effect on the firm's technology and at the same time is used as a signal sent to the activist group.

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Author contacts:

University of Peloponnese

Dept. of Economics

Terma Karaiskaki Str., Ktirio OAED

22100

Tripoli

Greece

Email: Dionisia.tzavara@eui.eu