The Political Economy of Environmental Pressure Groups

Eric Nævdal
Dept. of Economics and Social Sciences
Agricultural University of Norway
P.O. Box 5033
1432 Ås, Norway
e-mail: eric.naevdal@ios.nlh.no

Abstract

This paper examines the relationship between various sorts of environmental pressure groups and policy makers. It is argued that environmental pressure groups prefer various sorts of political activity, such as protest marches and blockades to manifesting their preferences through standard demand curves. It is also argued that this is in fact efficient for the environmental pressure groups, since it allows them to manifest their valuation of a good with lesser strain on their consumption of other goods. A model of the interaction between two environmental pressure groups with conflicting interests and a regulator is discussed.

1. Introduction

It is often the case that environmental pressure groups (EPGs) possess information on an environmental issue that is potentially valuable to policy makers. In particular does this apply to these organisations valuation of environmental projects. It is common for such organisations to try to signal this valuation through different kinds of political action. Common examples are protest marches and lobbying of political institutions. The present paper explains why this is a preferred method of signalling demand to more standard ways, such as paying for them in a market or entering into information revealing contracts with a policy maker. Economists have a tradition of being critical of political action as an efficient tool in the formation of policy. Forster (1993) is a good example of how economists typically regard EPGs. In this book Forster documents how business interests use the governments information gathering process to influence the outcome of the policy formation. Previous work on environmental pressure groups have assumed that it is possible to set up such contracts that specify money transfers from one or more agents to other agents. For example, see the literature on the Groves mechanism and/or state dependent contracts as suggested by Groves and Ledyard (1977), Groves and Ledyard (1980) or Green and Laffont (1978), and elaborated in the context of EPGs by Burton (1994). The analysis in the paper is that this is done without contracts or side payments, thus bringing the analysis closer to the real-world interaction between EPGs and governments. In some specific cases it may be appropriate to allow side-payments in a model of environmental pressure groups.

A recent article by Hurley and Shogren (1997) examines a case where there are no contracts, but where side-payments are enforced through the legal system. In this article, it is found that defamation suits are efficient in deterring EPGs that have a low valuation of environmental benefits, while allowing EPGs with high valuation to spread information in a credible

manner. This approach does seem appropriate within the U.S. legal system. In other democratic nations it is less likely that the legal system can be used in such a manner, since courts in e.g. most European countries are unlikely to inflict punitive damages large enough to bite. And even if the legal system could be used, it will often be the case that the EPG can hide itself so that it is hard to find anyone to sue.

In the absence of side payments, the incentives for the EPGs to reveal their private information lies in how the policy maker responds to the information that the policy maker receives. The problem for the policy maker is to determine optimal policy responses to the information revealed by the EPGs.

2. The Aims and Nature of Environmental Pressure Groups

This section elaborates in a informal way on some of the aspects of EPGs. It is argued that EPG activity, such as protest marches and illegal activity is an efficient way for signalling demand for an environmental good. It is also argued that the organisational structure of EPGs is chosen so that policy makers must deal with demand signalled in such a way rather than through more standard market mechanisms.

2.1. Signalling demand through EPG activity

The aims and nature of EPGs may seem simple and straight forward. To work for the implementation of desired environmental policies and to organise people with similar environmental preferences in a efficient manner. Economists like to think that agents are rational, so the organisation of EPGs must be assumed to reflect, at least to some degree, optimising behaviour. There are several striking features of EPGs that begs an explanation. EPGs rarely work through market mechanisms, preferring to speak with a political voice rather than backing their concern for the environment with cash in a

market. When EPGs do go to considerable expenditure in the fight for some environmental cause this expenditure is often used in a way that is seems unproductive in the sense that instead of spending money on effort directly linked to the production of some environmental good, EPGs seem to prefer sending signals that are more aimed at showing their concern. Usually these things take the form of demonstrations and petition of politicians, but also more extreme behaviour such as criminal activity or hunger strikes are not unheard of. It does seem odd that the use of these methods would be used if they were not considered effective from the EPGs point of view. There is a oral tradition among economists to argue that these methods are not socially efficient. In the sequel it will be argued that here economists are at least partially wrong. Standard demand theory tells us that a consumers marginal valuation of a good is roughly equal to the marginal value of the last unit of another good that the consumer. This would be true for a member EPG if the environmental priced as a private good. Let us now consider the possibility that the EPGs members use time on participating in a protest march. By participating the members spend time that could have been spent earning wages that could buy other goods. This is clearly a statement of the EPG members demand that satisfy standard demand theory. There is also another effect. Demonstrations are not fun. The disutility from attending a demonstration adds to the effect on welfare of reduced consumption of goods. This means that *for a given reduction in the funds available for the consumption of other goods than the environmental good the marginal disutility is larger when participating in a demonstration than when purchasing the environmental good in a market*. The implication is that political demonstrations allow the EPG members to signal a higher marginal valuation of the good than their financial means would have allowed. An extreme case is the unemployed and financially destitute tree hugger willing to accept a probability of going to jail for a cause. By doing this the freedom fighter

signals her demand by increasing consumption of a bad. A rich man, whose claustrophobia sets the marginal utility of an increased probability of going to jail to minus infinity, could signal his demand by reducing the consumption of one or more goods as he in effect would do if he bought the good at a price in a market. It should be clear that from an economic perspective these two actions are in principle the same. To separate the demand signalled through standard demand functions from demand signalled through the reduced consumption of goods and the increased consumption of bads that follows from EPG activity, the latter type of demand signal is termed *comprehensive* demand[1]. Note that there is a distinction between comprehensive demand and *conflict* as a direct instrument of change. Comprehensive demand is a tool that facilitates the signalling of information to a policy maker so that the policy maker can make a more or less informed decision. Conflict is aimed at literally forcing the policy maker to take certain actions or even to get rid of the policy maker altogether. In practice the distinction between the two concepts is blurred. In fact, history is full of examples of movements starting out signalling comprehensive demand and ended up as true combatants. A historical example is given by the Boston Tea Party developing into the American Revolution. A more recent example with environmentalists may be the organisation Sea Shepherd.

It must be added that an additional explanation for using political action as a signal of valuation may be that EPG members feel that valuation of environmental goods should not be subject to economic considerations only. As recently shown in Frey *et al* (1996), implementation of a policy with environmental consequences are indeed subject to non-economic

[1]The term is not a very good one, and the author would appreciate suggestions for a more suitable name.

considerations, and this may influence the EPG into using non-market methods of signalling their valuation.

2.2. The organisation of EPGs and Implications for Information Revelation

EPGs are usually quite informal organisations. The level of informality ranges from no formalised structure at all, to a relatively small, though often visible, EPG bureaucracy organising and/or acting on behalf of a larger group of people. In other words, the EPG bureaucracy co-ordinate the members signalling of comprehensive demand and/or get paid to signal comprehensive demand. In our context the most important aspect of the EPGs organisational structure is that the EPG bureaucracy can not enter into binding agreements on behalf of its members. This as opposed to e.g. unions who enter into agreements with employers that effectively constrains the actions of its members. Thus it is futile for a policy maker to enter into contracts with the EPG that require EPG members to behave in a certain way. In particular, it is impossible to make EPG members and only EPG members, pay for the provision of an environmental good. This fact makes quite a lot of the theory of mechanism design and asymmetric information irrelevant for a policy maker wanting to learn about the EPG members valuation of an environmental good, since most of the literature assumes binding agreements. Whether the organisational form of EPGs is informal by design or by convenience is an interesting question that will not be answered here. The result is however that a policy maker wanting to learn information from the EPG and its members can only monitor comprehensive demand as valid signals of information.

2.3. The relationship between policy makers and EPGs

In standard welfare economics, the policy maker is often a benign agent single-mindedly set on maximising social welfare. Putting aside for the moment the many problems raised by this assumption, how should such a policy maker respond to EPGs and comprehensive demand? Welfare economics provides the answer. If the comprehensive demand signalled by the EPG allows the policy maker to accurately establish the costs and benefits of the production of an environmental good, then it should be produced according to standard welfare economic criteria, such as marginal cost equals marginal benefit and so on. The fact that the organisational structure of EPGs prohibits the financial burden of producing the good to be levied on the EPG and its members does not change this. The financing is a purely distributional issue, although in practice budgetary and political constraints are likely to be a barrier. There are however some complications. How should the policy maker feel about the EPGs wholesale consumption/production of bads? Should the disutility from consuming the bad enter the social welfare function? If the policy maker is of the benign type, the answer is yes. In fact for some types of comprehensive demand the activity should enter the social welfare function twice. Both because of the disutility that the EPG inflicts on itself and because of the disutility that the EPG signals inflict on other parts of the economy.

If we leave the realm of normative welfare economics and discuss the relationship between EPG and policy maker from the perspective of positive public economics. These waters are indeed murky, since in order to model such a policy maker we must speculate on the preferences of such a policy maker. Even if a real world policy maker wants to implement a socially optimal production of environmental goods, does it care about the cost of protest marches. The answer to this question has some significance for the behaviour of the policy maker. If the policy maker includes the disutility from

EPG activity in the social welfare function, then it has a partial incentive to make decisions biased towards the EPG in order to avoid EPG activity. If the policy maker does not include the disutility from EPG behaviour then the policy maker will prefer to see the manifestation of comprehensive demand before making a decision.

The manifestation of comprehensive demand is however necessarily dependent on at least some degree of benevolence on the policy makers part. If a policy maker refuses to make decisions based in part on the information revealed through comprehensive demand signals, then there really is no point in sending any signals. Indeed, signals sent in the face of an uncaring policy maker is actually not comprehensive demand at all but rather conflict as defined above. In this paper it is thus assumed that the policy maker is benevolent. There are still game theoretical problems. In order to send an "optimal" comprehensive demand signal, must form expectations about how the policy maker responds to this signal. The policy maker must choose whether to implement policies in advance of sending any signals or whether to implement policies in response to comprehensive demand signals. Note that given the benevolence of the policy maker, the sending of comprehensive demand signals forces the policy maker to respond. When responding to a comprehensive demand signal the policy maker is actually facing a different, and somewhat simpler, problem than what is common in asymmetric information problems since the private information belongs to the EPG. Thus the policy maker does not have to design "contracts" that reveal the private information, but can be content with filtering the information it receives.

2.4. Industrial lobbyists

The discussion above relates to EPGs trying to increase the production of an environmental good. However most of the discussion applies verbatim to representatives of an industry trying to reduce the production of the environmental good. There are some caveats however. Although there is ample supply of industry spokesmen and apologists preaching the gospel of realism and economic necessity, the problem with such spokesmen is that they do not cost very much and as such are not suitable for signalling comprehensive demand. This paper will not make any definite statements on how industry signals comprehensive demand other than to note that advertising campaigns, lobbying and simple corruption does seem to be suitable vehicles. These questions should, and hopefully will, be studied in depth in a separate paper.

3. A model of interaction between a Policy Maker, an Environmental Pressure Group and an Industrial Lobbyist.

There are three agents in the model. Regulator (R), industrial lobbyist (IL) and Environmental Pressure Group (EPG). R is to decide on an environmental project and IL and EPG both wish to influence that decision. The project is to determine the value of a Variable $x \in X \subseteq \mathbb{R}_+$. The EPG's marginal willingness to pay for the project is assumed to be given by $m \sim f(m)$. x is assumed to be supplied at a cost, given by $\beta c(x)$, where $\beta \sim g(\beta)$ and $c(x)$ is assumed to be a strictly convex function. Knowledge of m is assumed to be private information to the EPG, and the true value of β is assumed to be private information to the IL. The EPG is assumed to pay a fraction α of the costs. The discussion in this paper will focus on the case where α is small in order to reflect that the EPG, or rather it's members, usually bears only a small fraction of a public good's costs. It is also assumed that EPG may assume a signalling cost $D \in \mathbb{R}_+$. Thus the EPG's objective function is given by:

$$\pi_{EPG} = E\left(mx - D - \alpha E(\beta)c(x)\right) \quad (2)$$

Maximising π_{EPG} with respect to x yields the policy, x_{EPG}, preferred by the EPG. x_{EPG} is defined by: m-$\alpha E(\beta)c'(x_{EPG}) = 0$. Industry is assumed to pay the rest of the cost, and the IL is assumed to be a selfless agent for industry. Also the IL may incur signalling costs given by $M \in \mathbb{R}_+$. The IL's objective function is given by:

$$\pi_{IL} = -(1-\alpha)\beta c(x) - M \quad (3)$$

Since the IL is assumed to derive no benefit from production of x, the IL's preferred policy is given by $x_{IL} = 0$.

R is assumed to have preferences given by:

$$\Pi = E\left(mx - M - D - \beta c(x)\right) \quad (3)$$

R recognises that the EPG's marginal willingness to pay, m, is legitimate and that production of x implies welfare gains. As opposed to the EPG and the IL, the R is concerned with all the costs of producing x. Finally, the R considers signalling costs *per se* as socially wasteful. The ideal levels of production from R's point of view would be $(x_{opt}, M, D) = (c^{-1}(m/\beta), 0, 0)$. Without receiving additional information from the EPG and the IL, the production of x would be given by: $x_R = c^{-1}(E(m)/\beta)$.

The game goes as follows. R makes an initial policy announcement, x_{ini}, which is irrelevant if R is not able to commit to any rules about how to respond to the signals from the EPG and the IL. The EPG and the IL then sends a comprehensive demand signal each. R uses these signals to update the

information on m and β, and then implements a policy x. This is a dynamic game of incomplete information and the reader is referred to Fudenberg and Tirole (1991) for a primer.

Let assume that the R knows a lower bounds on m and a lower bound on β. Then the R's decision problem is given by:

$$\max_{y} E\left(my - D - M - \beta c(y) | m \geq m^*, \beta \geq \beta^*\right) \tag{4}$$

m^* and β^* indicate the bounds on m and β. These bounds are given through the comprehensive demand signals and will be determined in the sequel. The first order condition to this problem reduces to:

$$E(m | m > m^*) = E(\beta | \beta > \beta^*) c'(x) \tag{5}$$

(5) defines a value $x=x(m^*,\beta^*)$. The comparative statics are straight forward. $x'_{m^*}(\cdot) > 0$ and $x'_{\beta^*}(\cdot) < 0$.

The effect of comprehensive demand signals

How does the signals the EPG and the IL sends affect policy? Firstly it is important to note that both the EPG and the IL does affect the choice of x, and that both are aware of their influence. Both the EPG and the IL forms expectations about the signals sent by the other agent. Since the true value of m is private information to the EPG, the signal D will be a random variable for the IL. Likewise, M will be a random variable for the EPG. For the R it is important to know what information m^* and β^* actually conveys. For the EPG, the following equation must apply for signalling to be profitable.

$$mx(m^*, \beta^*) - D - \alpha E(\beta) c\left(x\left(m^*, E(\beta^*)\right)\right) \geq mx\left(0, E(\beta^*)\right) - \alpha E(\beta) c\left(x\left(0, E(\beta^*)\right)\right) \tag{6}$$

Thus the true value of *m* must obey the following inequality:

$$m \geq m^* = \frac{D + \alpha\left(c\left(x\left(m^*, E(\beta^*)\right)\right) - c\left(x\left(0, E(\beta^*)\right)\right)\right)}{x\left(m^*, E(\beta^*)\right) - x\left(0, E(\beta^*)\right)} \tag{7}$$

It is straightforward to show that:

$$\frac{\partial m^*}{\partial D} = \frac{\dfrac{1}{x(m^*, E(\beta^*)) - x(0, E(\beta^*))}}{1 + x'_{m^*} \dfrac{\alpha\left[c(x(m^*, E(\beta^*))) - c(x(0, E(\beta^*))) - c'(x)(x(m^*, E(\beta^*)) - x(0, E(\beta^*)))\right]}{x(m^*, E(\beta^*)) - x(0, E(\beta^*))}} \tag{8}$$

Thus the lower bound on *m*, as perceived by R, increases as a function of signalling costs. One feature of (8) is that the more convex the cost function, the larger is the effect of signalling. For the IL, it must be true that:

$$-M - (1-\alpha)\beta c\left(x\left(m^*, E(m^*)\right)\right) \geq -(1-\alpha)\beta c\left(x\left(E(m^*), 0\right)\right) \tag{9}$$

which yields that:

$$\beta \geq \beta^* = \frac{M}{(1-\alpha)\left[c\left(x\left(E(m^*), \beta^*\right)\right) - x\left(E(m^*), 0\right)\right]} \tag{10}$$

Again the comparative statics are straight forward:

$$\frac{\partial \beta^*}{\partial M} = \frac{c'\left(x'_{\beta^*}(m^*, \beta^*)\right)}{(1-\alpha)\left[c\left(x\left(E(m^*), \beta^*\right)\right) - c\left(x\left(E(m^*), 0\right)\right)\right]} > 0 \tag{11}$$

Here we note that if the larger the marginal cost at $x'_{\beta^*}\left(E(m^*), \beta^*\right)$, the larger is the effect of signalling.

Optimal Comprehensive Demand Signals

For the EPG, the optimal signal is determined by the solution to the program:

$$\max_{D}\Big(mx\big(m*(D),E\beta*\big)-D-\alpha E(\beta)c\Big(x\big(m*(D),E\beta*\big)\Big)\Big) \tag{12}$$

The first order condition may be written:

$$\frac{\partial m*}{\partial D}=\frac{1}{x'_{m*}\Big(m-\alpha E(\beta)c'\big(x(m*,E\beta*)\big)\Big)} \tag{13}$$

Here $\partial m*/\partial D$ is given by (8). It is worth noting that if an equilibrium exists, it can not be that $x(m*,\beta*) = x_{EPG}$, since the first order condition is not well defined if this is the case. Actually, $x(m*,\beta*) > x_{EPG}$ can not be the case either, since that would imply that $\partial m*/\partial D < 0$, which contradicts (11). (It should be fairly obvious to see this by examining R's optimisation problem.) For the IL, the objective is given by:

$$\min_{M}\Big(M+(1-\alpha)\beta c\Big(x\big(m*,\beta*(M)\big)\Big)\Big) \tag{14}$$

The first order condition for this problem may be written:

$$\frac{\partial\beta*}{\partial M}=\frac{-1}{(1-\alpha)\beta c'\big(x(m*,\beta*)\big)x'_{\beta*}} \tag{15}$$

Where $\partial\beta*/\partial M$ is given by (11). We note that if $c'(0) = 0$, then the IL will not achieve the first best solution, since that implies that the first order condition is not well defined. Having determined the optimal signal from the EPG and the IL from (13) and (15) they can be inserted into (5). The production of x is thus given by:

$$x=x\big(m,\beta,E(m),E(\beta)\big) \tag{16}$$

That $\left|x\left(m,\beta,E(m),E(\beta)\right)-c^{-1}\left(m/\beta\right)\right|<\left|x_{ini}-c^{-1}\left(m/\beta\right)\right|$ follows directly from $x\left(m,\beta,E(m),E(\beta)\right)$ being the result of a optimisation on a less coarse information partition.

4. Conclusions

The present paper has discussed some aspects of the relationship between environmental pressure groups and regulating authorities. It has been argued that political actions are en efficient way for environmental pressure groups to signal demand to regulating authorities. A model has been presented that formally illustrates how environmental pressure groups

References

Burton, P. S., 1994. Land Use Externalities: Mechanism Design for the Allocation of Environmental Resources, *Journal of Environmental Economics and Management*, 30(2):174-185.

Forster, B. A., 1993. The Acid Rain Debate: Science and Special Interests in Policy Formation. Iowa State University Press, Ames Iowa.

Frey, B. S., F. Oberholzer-Gee and R. Eichenberger, 1996. Markets and Morals, *Journal of Political Economy*, 104 (6):1297-1313.

Fudenberg, D. and J. Tirole, 1991. Game Theory. MIT Press, Cambridge, Massachusetts.

Green, J. and J-J. Laffont, 1978. An Incentive Compatible Planning Procedure for Public Good Production, *Scandinavian Journal of Economics*.

Groves, T. and J. Ledyard, 1977. Optimal Allocation of Public Goods, the Solution to the "Free-Rider" Problem, *Econometrica* 45:783-809.

Groves, T. and J. Ledyard, 1980. The Existence of Efficient and Incentive Compatible Equilibria with Public Goods, *Econometrica*. 48:1487-1506.

Hartle, D.G., 1983. The Theory of "Rent-Seeking": Some Reflections, *Canadian Journal of Economics*, 16:539-554.

Hurley, Terrence M. and J. Shogren. Environmental Conflicts and the SLAPP, (1997). *Journal of Environmental Economics and Management*. 33,253-273 (1997).