Direct Public Involvement in Environmental Policymaking: A Bargaining Model

Christopher Bruce

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The purpose of this paper is to develop a model of one of the most ambitious forms of public participation, which I call public policymaking. For this purpose, I investigate the bargaining process between two groups that I will call environmentalists and developers. I present the argument in two stages. In the first, I employ a model developed by Zeuthen and Harsanyi to predict the nature of the bargained outcome under certain simplifying assumptions. In the second, I relax these assumptions to investigate the impact of alternative institutional arrangements on the bargaining process. I conclude that public policymaking offers some prospect for improving government policy with respect to environmental issues, if certain conditions are met.

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As citizens have become better informed and better educated, they have demanded increasing levels of accountability from their governments. This has been particularly true in the field of environmental policy-making. In the last three decades, citizens have demanded that they be given ever-greater involvement in the setting of government policies concerning air and water pollution, endangered species, and public land use. Whereas the government was initially able to meet these demands through the solicitation of public input – for example, through the holding of public hearings – increasing pressure has been placed on governments to allow citizens to become directly involved in the processes by which rules, regulations, and government policies are drafted.

Citizen disaffection has been so widespread that hundreds of different types of direct involvement have sprung up at virtually every level of government in North America and Europe. These processes have appeared under a number of different guises – among them consensus-building, mediation, conflict resolution, environmental dispute settlement, negotiated rulemaking, and alternative dispute resolution – reflecting their varied origins. They range from the very informal, such as those employed by the Quincy Library Group¹ - a group of citizens meeting in a local library to develop a proposal for regional development – to the very formal, such as those required by the U. S. Negotiated Rulemaking Act² or the province of British Columbia’s Land and Resource Management Plans (British Columbia, 1997). But all share the properties that they are open to all interested parties, that those parties are expected to develop a policy that is acceptable to all participants, and that the parties operate under the assumption, or understanding, that their proposals will be adopted by the government. That is, unlike previous forms of public participation, what I will call public policymaking asks the public to do more than simply provide opinions to the government. Rather, it asks interest groups to develop government policy themselves, through a process of negotiation and compromise.

¹ See the Quincy Library Group website at http://www qlg.org
² See, especially, Pritzker and Dalton (1995) and Coglianese (1997). The government department that has made greatest use of this Act is the Environmental Protection Agency.
A large and diffuse literature now exists in which examples of public policymaking have been described and the advantages and disadvantages of the various forms of that involvement have been debated. What this literature lacks, however, is a model of the process by which interest groups attain their compromise proposals. The purpose of this paper is to offer such a model and to use that model to investigate whether public policymaking can be expected to meet the goals claimed for it by its proponents. For this purpose, Section 1 introduces some of the most important questions that must be answered concerning public policymaking. Section 2 develops a stylized model of the policymaking negotiation process. And Section 3 extends the analysis by relaxing some of the assumptions made in the second section.

1. Questions to be Resolved

If public policymaking is to be accepted as a viable process, a number of questions about that process will have to be answered. Some of these include:

1. **What are the circumstances in which the parties can be expected to enter the negotiation process?** Two issues are involved here. First, in those circumstances in which it is determined that public policymaking is in the public interest, it is important to identify the types of impediments that might deter one or more interest groups from participating. Second, it must also be determined whether there are circumstances in which non-participation might be the optimal outcome. That is, does a refusal by interest groups to enter the public policymaking process necessarily imply that that process has failed? Or are there circumstances in which that is the (socially) optimal response by those groups?

2. **If the parties do enter negotiations, can it be anticipated that they will be able to negotiate a policy that is acceptable to both of them?** If so, what is the nature of that policy?

3. **Will the policies reached through interest group negotiation meet the goals of the government?** If not, how will the government respond?

4. **What is the government’s role in the negotiation process?** Can the government leave the parties to initiate and conclude negotiations themselves, or will it need to take an active role? And, if so, what is the nature of that role?
5. Once the parties have proposed a policy to the government, can they be expected to support the implementation of that policy, or will they lobby the government and courts for further changes? It is commonly argued that interest groups will be less likely to oppose a policy that they have constructed themselves than one that was developed by a government agency. One of the purposes of this paper will be to investigate the theoretical underpinnings of this argument, to determine whether there are circumstances in which it might not be correct.\(^3\)

These questions can best be answered within the context of a formal model of the negotiation process. The purpose of the following two sections of this paper will be to set out the basis of one such model.

### 2. A Model of Interest Group Negotiation

The model will investigate the process by which governments allocate public lands among alternative uses. For example, these lands might be divided between commercial uses – such as agriculture, logging, or mining – and “public” uses – such as recreation and wildlife preservation. Within those allocations, various constraints may be placed on permissible uses. With respect to commercial lands, for example, ranchers might be required to prevent their cattle from disturbing riparian ecosystems or logging companies might not be allowed to use clear-cutting techniques. On public lands, limits might be set on the number of hotels that can be built or on the number of miles of roads that can be constructed. For the purposes of the model, assume that these alternatives can be captured in two characteristics: (i) the number of acres of public land to be set aside as environmental reserve, A, and (ii) the level of (environmental) restrictions to be placed on the commercial and recreational use of each acre of land in that reserve, R\(^4\).

There are three actors in the model: the government and two interest groups, environmentalists and developers. The government is assumed to be a vote maximiser

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\(^3\) Coglianese (xx) has provided evidence to suggest that interest groups are just as likely to appeal regulations that have been established using the “reg-neg” process as those that have been established using traditional means. What I wish to ask here is whether reg-neg, or any other public policymaking process, can necessarily be expected to reduce interest groups’ incentive to employ the appeal process.

\(^4\) It is not necessary to assume that there are no restrictions placed on lands outside the reserve; only that the level of those restrictions is fixed.
and, as such, to be interested in maximising the sum of the interest groups’ utilities. Its ability to do so, however, is limited by its lack of information about the parties’ true utility functions. Accordingly, although it may use its best estimate of the parties’ preferences to select a policy, $G(A_g, R_g)$, it recognizes that $G$ may be Pareto inefficient. In an effort to find a superior outcome, it either establishes a formal process in which environmentalists and developers are invited to construct their own proposal; or it signals to the parties that it would be prepared to implement any proposal that they had developed informally. In either case, $G(A_g, R_g)$ will be adopted if the parties fail to reach a joint agreement.

Environmentalists and developers, therefore, can be said to bargain with one another “in the shadow” of policy $G(A_g, R_g)$. Figure 1 represents the preference functions of the two parties to this bargaining process. The vertical axis measures the strength of the restrictions on each acre of land in the environmental reserve, while the horizontal axis measures the number of acres within that reserve. As environmentalists prefer both stronger restrictions and additional acres of reserve, their indifference curves are convex to the origin and increasing in utility as both $A$ and $R$ increase. Conversely, the developers’ indifference curves are concave to the origin and increase in utility as both $A$ and $R$ decrease.

If point $G$ in Figure 1 represents the government’s proposed policy, the area between the indifference curves that pass through $G$ represents the “bargaining lens,” that is, the set of outcomes that the parties jointly prefer to $G$. If it is assumed that the parties are unable to bribe one another to accept an outcome outside the bargaining lens—that is, perhaps because the free rider problem prevents the environmentalists from raising sufficient funds for such a bribe; and because difficulties of identifying the parties to whom funds should be paid prevents developers from bribing environmentalists—traditional models of exchange predict that rational, well-informed parties will agree to a Pareto efficient outcome along segment MN of the contract curve. These models cannot be used, however, to predict where, along MN, the outcome will occur.

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5Assume that the probability that any individual voter will vote for the government increases as government policy approaches the voter’s preferred set. In that case, any policy that increases the sum of voter preferences must increase the number of votes the government expects to receive.
Nevertheless, a bargaining model developed by Zeuthen (1930), and elaborated on by Harsanyi (1977), can be modified to allow for such a prediction. Again, assume that the government has announced that if the parties fail to reach agreement, it will impose outcome G. Assume also that the parties consider this announcement to be credible. Segment MN in Figure 1 describes the locus of the set of efficient outcomes defined by G. That is, MN represents the total gains that can be divided between environmentalists and developers; and any point along MN can be represented by the proportion in which those gains are allocated between the parties. In particular, let $s$ refer to the percentage of the gains obtained by environmentalists and $(1-s)$ refer to the percentage obtained by developers.

\footnote{Alternatively, $G(A_e,R_g)$ may simply be a draft proposal or it may be “inherited” from a previous government.}
Figure 1  Zeuthen-Harsanyi Model

Restrictions on Development

Acres of Environmental Reserve
Assume, initially, that environmentalists have offered to accept share $s_e$ while developers have offered them share $s_d$. In the Zeuthen-Harsanyi model, it is assumed that the environmentalists perceive there to be a probability $r_e$ that if they fail to make any concessions on $s_e$ negotiations will collapse and outcome $G$ will be imposed. Conversely, they perceive there to be a probability $(1-r_e)$ that the developers will capitulate to their demands. Thus, the expected value of making no concessions is

$$(1-r_e) \cdot u_e(s_e) + r_e \cdot u_e(G)$$

If the environmentalists accept the developers’ offer, on the other hand, they will receive utility level $u_e(s_d)$. Thus, environmentalists will refuse to make any concessions on $s_e$ if

$$(1-r_e) \cdot u_e(s_e) + r_e \cdot u_e(G) > u_e(s_d) \tag{1}$$

Similarly, developers will refuse to make concessions if

$$(1-r_d) \cdot u_d(1-s_d) + r_d \cdot u_d(G) > u_d(1-s_e) \tag{2}$$

From these inequalities, it is possible to determine the maximum risk that each side will be willing to incur rather than concede to the other. This risk, $r^*$, is the value of $r$ that equates the two sides of inequalities (1) and (2) respectively. For example, the maximum risk the environmentalists will accept is found from:

$$\frac{u_e(s_e) - u_e(s_d)}{u_e(s_e) - u_e(G)} = r^*_e \tag{3}$$

Similarly, $r^*_d$ is found to be:

$$\frac{u_d(1-s_d) - u_d(1-s_e)}{u_d(1-s_d) - u_d(G)} = r^*_d \tag{4}$$

(In the literature on labor negotiations, the numerator in equations (3) and (4) is often referred to as the “cost of agreeing” (to the other party’s offer) and the denominator is referred to as the “cost of disagreeing.”)

Zeuthen and Harsanyi assume that the party that is less willing to risk a breakdown of negotiations – that is, the side with the lower value of $r^*$ - will make the “next” concession. Thus, if $r^*_e > r^*_d$, it is the developers that will concede. As that
concession will reduce both the numerator and denominator of (3) but will reduce only
the numerator of (4), \( r_e^* \) will fall relative to \( r_d^* \). If developers make sufficient
concessions \( r_e^* \) will fall below \( r_d^* \) and it will be the environmentalists that will make the
next concession. As long as the parties correctly evaluate one another’s bargaining
positions, this process is predicted to continue until agreement is reached.

In particular, Harsanyi (1977: 152) has shown that that agreement will be reached
at the point at which the Nash product has its maximum value. Note that (3) and (4)
imply that developers will continue to make concessions as long as:

\[
\frac{u_d(1-s_d)-u_d(1-s_e)}{u_e(1-s_d)-u_d(G)} < \frac{u_e(s_e)-u_e(s_d)}{u_e(s_d)-u_e(G)}
\]

With manipulation, this can be rewritten as

\[
[u_d(1-s_d)-u_d(G)]\cdot[u_d(1-s_e)-u_d(G)] < [u_e(s_e)-u_e(G)]\cdot[u_d(1-s_e)-u_d(G)]
\]

Each of the terms in square brackets measures the cost of conflict for one of the parties,
that is, the loss of utility to that party if it is required to accept the non-negotiated
(imposed) outcome, \( G \), rather than some negotiated outcome, \( s_i \). The terms on the left
side of inequality (5), for example, represent the costs of conflict to the respective parties
relative to the offer that has been made by the developers, \( s_d \). The product of the two
terms on either side of the inequality is referred to as the Nash product.

It was argued above that when inequality (5) holds, it is the developers that will
make the next concession. That is, as long as the Nash product is lower when it is the
developers’ offer that is being considered than when it is the environmentalists’ offer, the
developer will be induced to make a concession. Once the developers have made
sufficient concessions that the Nash product from consideration of the developers’ offer
has risen above that from consideration of the environmentalists’ offer, it will be the
environmentalists that will make the next concession. This process is predicted to
continue until there are no higher Nash products remaining, that is, until the Nash product
has been maximised. At this point the parties are predicted to reach agreement as neither
party will be able to make a counter offer that raises the Nash product, (that is, that
reverses inequality (5) in its favour). Call the outcome of this process \( s^* \).
One of the questions raised in Section 1 was whether $s^*$ equals $s^{**}$, the value of $s$ that maximises the sum of the two parties’ utility levels:

$$u_e(s) + u_d(1 - s)$$

Through simple differentiation, $s^{**}$ is found where

$$\frac{\partial u_e}{\partial s} / \frac{\partial u_d}{\partial s} = 1 \quad (6)$$

In contrast, $s^*$ is found by differentiating the Nash product, to yield

$$\frac{\partial u_e}{\partial s} u_d(1 - s) - u_e(s) \frac{\partial u_d}{\partial s} - u_e(s) \frac{\partial u_e}{\partial s} - u_d(G) + \frac{\partial u_d}{\partial s} u_e(G) = 0$$

or

$$\frac{\partial u_e}{\partial s} / \frac{\partial u_d}{\partial s} = \frac{u_e(s) - u_e(G)}{u_d(1 - s) - u_d(G)} \quad (7)$$

It is only in exceptional circumstances\(^8\) that one would expect the right hand side of (7) to equal 1. Thus, although $s^*$ was predicted to be efficient, it is predicted to be neither welfare- nor vote-maximizing.

A number of predictions concerning public policymaking can be derived from this simplified version of the model.

1. **A necessary condition for bargaining to take place is that the default policy chosen by the government, $G$, must be inefficient:** By definition, if $G$ is efficient, the parties will not be able to find an alternative policy that is acceptable to both of them and bargaining will not take place. By implication, therefore, neither a lack of willingness among interest groups to take part in negotiations nor a failure of interest groups to obtain a negotiated outcome necessarily indicates a deficiency in the public policymaking process. It may

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\(^8\) One such circumstance is that in which the government had announced a non-negotiated outcome, $G$, that was so objectionable to both parties that $u_e(G)$ and $u_d(G)$ dominated the ratio. For example, if environmentalists and logging companies were negotiating over the use of a forest, the government might announce that if they failed to reach consensus, it would bulldoze the entire forest and convert it to waste land. Under normal circumstances, however, such extreme threats by the government would not be credible.
simply be that the parties consider the current government policy to be efficient.

2. A sufficient condition for bargaining to take place is that the degree of inefficiency inherent in G is large enough that the expected gains from bargaining exceed the expected costs: That is, the inefficiency of G is not only necessary for bargaining to take place but also, if transaction costs are low enough, will be sufficient. An important corollary of this prediction is that bargaining may take place even in the absence of government intervention. If the government has introduced an inefficient policy, interest groups can be expected to recognize the opportunity to make Pareto improvements on that policy. If transactions costs are low enough, and the parties believe that the government will adopt or condone a privately-reached agreement, negotiation can be expected to take place even in the absence of government sanction. In the United States, for example, a considerable amount of private bargaining has taken place in the shadow of the Endangered Species Act. In some cases, this bargaining has simply led to informal agreements between environmental groups and developers. In others, however, informal negotiation has yielded solutions of sufficiently general value that they have been adopted as official government regulations. For example, the “habitat conservation plan” exemption in the Endangered Species Act is reputed to have had its origins in informal bargaining.9

3. It is in the government’s interest to encourage public policymaking: The model suggests that public policymaking will produce Pareto improving outcomes. Hence, government support for public policymaking will require only a positive correlation between individuals’ levels of utility and their willingness to vote for the governing party.

4. Although agreements reached between environmentalists and developers can be expected to be Pareto efficient, they cannot be expected to be utility maximizing: There are two reasons why utility may not be maximized. First, if

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9 The U. S. Congress was urged to create Section 10 (a) of the Endangered Species Act by proponents of a habitat conservation plan on San Bruno Mountain, California. (Aengst et. al. 1997).
the default government policy, G, is poorly chosen, the social optimum may lie outside the bargaining lens defined by G. For example, it might be represented by a point such as X in Figure 1. Second, because the bargained outcome is strongly influenced by G, (see equation (7), above), that outcome can be expected to differ from the policy that maximizes social utility.\(^\text{10}\) Thus, if the latter policy is closely correlated with the policy that will maximize votes for the governing party, the government may have an incentive to reopen negotiations or to listen to representations from one of the interest groups to revise the negotiated outcome.

5. Nevertheless, the model presented above suggests that, once the government has agreed to adopt a policy that was selected through the public policymaking process, it will reject requests from interest groups to alter that policy: In the Zeuthen-Harsanyi model, the parties are willing to make concessions on the default position, G, only if they believe that they will receive some benefit in return. As those benefits derive from moves towards the efficient set of outcomes, parties will only engage in negotiation with one another if they believe that the outcome so-reached will be adopted. That is, the government must commit \textit{ex ante} to implementation of the selected policy. \textit{Ex post} it may have an incentive to renege on this commitment, as argued above. But, if it does so, its reputation for commitment will be weakened and future bargaining will be inhibited. Indeed, even if it had made no commitment with respect to a particular set of negotiations – such as when the parties had bargained informally – the government may wish to enforce the agreement that had been reached in order to encourage other parties to engage in informal, efficient bargaining in the future.

\(^{10}\) An interesting corollary of this conclusion is that the Coase Theorem does not apply in the circumstances described in this paper. Because the model assumes that the parties bargain only over \(A\) and \(R\), the ultimate outcome selected by the parties will be determined (uniquely) by the initial allocation of \(A\) and \(R\) that was chosen by the government. Coase’s Theorem, by contrast, predicts that the ultimate distribution of resources will be independent of the initial distribution of property rights.
3. Extensions to the Model

Additional predictions concerning public policymaking can be made if four of the simplifying assumptions that were made in Section 2 are relaxed.

1. The government is unable to offer a clear default policy, G: In the Zeuthen-Harsanyi model, it is the threat of an inefficient government policy, G, that induces the parties to make concessions to one another and, ultimately, to reach a negotiated settlement. If the government wishes to encourage such a settlement – because it anticipates that it will obtain more votes for an efficient policy than an inefficient one – it will specify a clear default position. There may be circumstances, however, in which the government cannot commit itself to such a position. Most importantly, the parties may believe that they would be able to convince the courts to overturn the government’s policy. In this case, if each of the parties overestimated its own ability to influence the legal outcome, each of them would come to believe that its bargaining position was stronger than that of its opponent and bargaining would break down. On the other hand, the threat of legal action may raise the expected costs of a break down in negotiations sufficiently that the parties would be provided an even stronger incentive to reach a bargained outcome.

2. The government is unable to commit itself to implementation of policies negotiated by interest groups: If the parties are to be induced to reach a negotiated outcome, they must be convinced that that outcome will be implemented by the government. As it is in the government’s interest to offer such a commitment, it might be expected that this constraint on public policymaking would not be binding. However, again, an activist court may be willing to intervene to overturn even a freely bargained outcome. The cost to either party of raising a legal appeal is that future negotiations would be inhibited by uncertainty concerning the implementability of bargained outcomes. One would expect, therefore, that such appeals would be most

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11 Effectively, u(G) would be decreased for both parties; or, conversely, the cost of disagreement would be increased.
likely in those cases in which (i) G so clearly favored one party over the other
that the disfavored party considered the potential benefits from litigation to
exceed the costs; or (ii) one party did not expect to participate in future public
policymaking negotiations – for example, it was interested only in local land
use issues - and, therefore, expected to incur no costs from inhibition of those
negotiations.

3. **The government is not a utility-maximizer:** In Section 2, it was assumed
that the government would maximize its probability of re-election by
maximizing the sum of voters’ utility levels. In practice, however, political
parties rarely have to obtain more than 50 percent of the vote in order to be
elected. It may, therefore, be possible (or even desirable) for a party to ignore
the preferences of those voters whose ideology differs significantly from its
own and concentrate instead on the, say, sixty or seventy percent with whom
it has the greatest affinity. In this case, it may have relatively little concern for
the preferences of one or more of the interest groups to the policymaking
process.

Such a lack of concern is *not* predicted to alter the government’s
willingness to engage in the public policymaking process, however, as that
process is expected to yield policies that *all* parties prefer to the default
position. Rather, the government’s best strategy will be to select a default
position that favors the groups whose votes it is attempting to win and to
encourage all parties to negotiate a policy in that shadow of that position. In
such a case, the “disfavored” party (or parties) will have little attachment to
the “voluntarily” negotiated policy and can be expected to work actively to
overturn their “own” policy.

4. **The government imposes constraints on the bargained outcome:** In Section
2, it was assumed that there were only two types of actors: the government
and special interest groups. The government may also be concerned about a
third group, however – those voters whose interest in land use planning is not
sufficient to induce them to join an organized group, but whose voting
behavior may, nevertheless, be influenced by the government’s choice of land
use policies. As these voters will not be present at the negotiating table, the government may wish to incorporate their preferences by placing constraints on the outcomes it will accept from the public policymaking process. If it sets those constraints in such a way that the parties are unable to reach a Pareto efficient outcome, two responses seem possible. First, if the constraints are sufficiently severe, the parties may anticipate that the costs of the negotiation process will exceed the potential gains and will refuse to enter the negotiation process. Second, if they do negotiate an outcome, the parties will recognize that a superior policy exists and they can be expected to lobby the government to select such a policy.

This analysis suggests that if the government wishes to incorporate the views of unorganized voters into the public policymaking process, it may wish to find a technique other than the setting of constraints. One possibility might be to appoint an informed party to the negotiating process to represent unorganized voters. This party would be able to engage in the exchange of concessions, as described in Section 2, thereby allowing the process to approach an efficient outcome more closely than if fixed constraints were established in advance.

4. Conclusions

In this section, I return to the questions that were posed in Section 1.

1. What are the circumstances in which the parties can be expected to enter the negotiation process? The parties can be expected to enter negotiations if: the government’s default position is inefficient, the government will commit to implementation of any negotiated policy, and the cost of the negotiation process does not exceed the benefits. In turn, the potential benefits of negotiation will increase with the inefficiency of the government’s default policy; and will decrease with the strictness of the constraints that the government places on the potential outcome of negotiations.

2. If the parties do enter negotiations, will they agree to an efficient outcome? As long as the government does not introduce external constraints to the bargaining process, it is anticipated that the parties will exhaust all possible mutually beneficial “trades.”
3. **Will the policies reached through interest group negotiation meet the goals of the government?** It was argued that a vote-maximizing government would wish to maximize the sum of the parties’ utilities. The public policymaking process does not yield such outcomes, however. The parties are predicted to reach outcomes that are efficient, relative to the government’s default policy. But the negotiation process is not predicted to yield outcomes that maximize utility. Nevertheless, if the government is to obtain the cooperation of interest groups, it will have to assure them that any outcome they reach will be implemented. As a result, if the government wishes to employ public policymaking, it will have to accept outcomes that it considers to be less than optimal.

4. **What will the government’s role in the negotiation process be?** The parties will only be willing to bargain in good faith if they believe both that the government will put their recommendations into practice and that it will not succumb to pressure to overturn those recommendations. Hence, the government’s primary role will be to signal that it will implement any policy that has been obtained through a public policymaking process. There may also be a role for the government to send individuals to the bargaining process to represent voters who do not belong to organized interest groups.

5. **Once the parties have proposed a policy to the government, can they be expected to support the implementation of that policy, or will they lobby the government for further changes?** Many observers of public policymaking appear to believe that, if interest groups reach a voluntary agreement concerning public policy, those groups must be satisfied with that agreement. Therefore, it is predicted that parties will not lobby the government for changes to such an agreement. The model outlined in this paper, however, suggests that the “voluntary” agreements reached by interest groups are strongly influenced by the parties’ expectations concerning the government’s default policy. That is, the agreements reached through negotiation do not represent the “maximum maximorum;” rather they are merely the best the parties can do, given the implicit constraints imposed on them. Accordingly, there is no reason to believe that the parties will be entirely satisfied with their “agreements” or that they will refrain from lobbying for changes to those agreements.
References