Partial Compliance with Economic Sanctions:
A Theoretical Explanation

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Abstract

By bridging the gap between the strategic model of sanctions and the public choice framework of sanctions, we introduce a new sanctions game. Contrary to an earlier finding, we show that the partial compliance of the target country along with mild sanctions are not only equilibrium, but also Pareto superior to non-compliance and tough economic sanctions.

Keywords: Economic sanctions, sanctions game.

JEL classification: O1, F13, P16, C72

1 Introduction

Economic sanctions have been widely used as instruments of foreign policy in order to intervene in the politico-socio-economic conditions in the target[1] countries. Sanctions have a relatively a long history from the United Kingdom sanctions against Germany during 1914-1918 to the numerous sanctions, some of which are on going, imposed unilaterally or in coalition with the United Nations on some target countries. Altogether, there have been over one hundred and fifty cases of sanctions imposed usually by industrialized countries on different targeted (developing) countries since early 1910's.

Cases of economic sanctions imposed by developed countries on other developed countries, such as UK sanctions on Germany during WWI, are rare. On the contrary, most sanctions were imposed by developed countries on developing countries. Among the recent examples of these cases are the United Nations sponsored sanctions imposed on Iraq after the invasion of Kuwait which continued until 2003.

In the United States, Congress has enacted many legislations in connection with imposing sanctions on foreign countries. The Trading With Enemy Act of 1917 (TWEA) grants the President the authority of inflicting economic sanctions in times of war. TWEA was amended in 1933 in order to broaden the President's authority in imposing sanctions during national emergency times. Based on TWEA, President Truman issued a proclamation against communism in December of 1950, followed by sanctions that were imposed on China and North Korea, known as the Foreign Asset Control Regulations (FACR). FACR were a set of regulations for imposing embargo on unlicensed financial and commercial transactions between the US nationals and the target countries. Later in 1963, FACR was used to impose trade embargo on Cuba. The authority granted to the President by TWEA was limited through amendment of 1977. In 1961 the Foreign Assistance Act (FAA) was designed to frame and direct foreign aid programs. FAA, explicitly, not only excluded Cuba, but also granted the President the right to exercise trade embargo against Cuba. Based on FAA, President Kennedy issued proclamation of February 1962, which declared trade embargo against Cuba. Furthermore, the Comprehensive Anti-Apartheid Act (CAAA) of 1986 was legislated to define US policy towards Apartheid in South Africa.

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[1]We use the term "sender" for the country, the league of nations, or international organization who impose the sanction. On the other hand, the term target is used to designate the country on which the sanction is inflicted.

Among the latest sanctions legislation, the Cuban Democracy Act of 1992 was engineered by Congress and signed by President Bush to provoke peaceful transition to democracy in Cuba. The Iran and Libya Sanctions Act was designed to limit foreign investment in these countries, and the Iraq Sanctions Act was legislated following Iraqi invasion of Kuwait. For a comprehensive major U.S. Laws regarding sanctions see, Farmer (2000).

In an interesting paper Van Bergeijk and Van Marrewijk (1994) argue that high unilateral sanctions, while costly for both target and sender countries, could induce the target country to comply positively to sanctions. Using a public choice framework, Spindler (1995) concludes that "public choice analysis suggests that quantity-sanctions will generally be chosen over revenue-sanctions." In another study Van Bergeijk and Van Marrewijk (1995) show, among other things, that economic sanctions could be successful in the long run if "the learning effect dominates the adjustment effect" of sanctions.

As pointed out by Elliot and Hufbauer (1999) business community in the U.S. and other countries is an important force against sanctions while many "high-profile unilateral" sanctions are imposed to appease interest groups and are particularly politically driven. Farmer (2000) points out that although sanctions could be costly for a particular group, they could increase national welfare if the restricted trade is based on trade subsidies.

Among a few theoretical studies on sanctions, Eaton and Engers (1992) and Kaempfer and Lowenberg (1988) stand out. In their paper, Eaton and Engers (1992) analyzed a two-person (sender and target) sanctions game with alternating-move, based on which they investigated the *Markov perfect equilibrium* of the game. Kaempfer and Lowenberg (1988) investigated the internal political equilibrium by formulating the presence of pressure groups. However, in this public choice formulation of economic sanctions and pressure groups, the behavior of the target country is absent.[2]

In the present paper we incorporate the interaction between the sender and the target into public choice framework of Kaempfer and Lowenberg (1992). In doing so, we formulate a variant of Kaempfer and Lowenberg's (1992) model and extend it to include interactive behavior of sender and target. In our sanctions game, due to implicit formulation of pro-sanctions and counter-sanctions lobby groups, the sender government goes to the ne-

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[2]For more studies on sanctions. see also Major and McGann (2006). McGillivary and Stam (2004). Singleton and Griswold (1999). Elliott and Hufbauer (1999). Elliott and Uimonen (1993). and Leidy (1989).

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gotiation table (with the target) with a mandate given by internal political pressures (political market). As a result, our sanctions game is different from Eaton and Engers's (1992) game. In many circumstances the sender government is not directly concerned about the compliance of the target country, but rather is primarily interested in being re-elected and therefore would try to accommodate the internal political forces. The pro-sanctions groups lobby to induce the sender government to impose sanctions on the target, while the counter-sanctions groups may lobby for the lifting of sanctions. However, we acknowledge that, as is the case for most theoretical works, our set up may not be able to explain all possible real life scenarios regarding sanctions. It is rather an attempt to formulate the environment in which the sender and the target interact using economic analysis.

As our main result, we show that partial compliance of the target country along with mild sanctions are not only equilibrium, but also Pareto superior to non-compliance and tough economic sanctions. This result is different from an earlier finding by Kaempfer and Lowenberg (1988).

The structure of the paper is as follows. In the section 2 we present the model and, in section 3, we introduce our sanctions game and derive our results. Finally, in the last section we draw the concluding remarks along with some suggestion on future research on sanctions.

2 The Model

Assume two countries, sender and target. Assume that there are two pressure groups in the sender country, a pro-sanctions group and a counter-sanctions group, denoted respectively by H and B. The counter-sanctions group B includes only business members, whose payoff decreases by infliction of economic sanctions; for instance, some oil and gas exploration and development companies lose revenue due to economic sanctions imposed on Iraq and Libya. The pro-sanctions group H includes both business members, who would gain financially from economic sanction, and political activists who are concerned about the degree of compliance of the target country. As a result of this common interest, although for different reasons, members of group H lobby together to induce infliction of economic sanctions on the target country. The utility function for the group H is defined as

$$u^H(y^H, d) \qquad (1)$$

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where y^H and d are the joint income of group H and the level of compliance of the target country, respectively[3]. We assume that $u_{y^H}^H > 0, u_d^H > 0, u_{y^H d}^H < 0$ (we will state the rationale for this assumption later), and u^H is strictly concave.

Assume that the income of the group H is affected by sanctions in the following manner

$$y^H = f^H(s) \tag{2}$$

where s denotes the level of sanctions and $f_s^H > 0$ and $f_{ss}^H = 0$. Note that the income of business members of H is positively related to the level of sanctions, while the income of political members may not be related to s. Therefore, for the group as a whole, the income is positively related to s.

As stated earlier, $u_{y^H d}^H < 0$. The intuitive explanation of this assumption is that as the level of compliance increases, the marginal utility of income (acquired due to infliction of sanctions) reduces, and vice versa. To clarify the rationale behind this assumption, note that y^H denotes the income generated by group H through imposing sanctions (sanctions income). With target's compliance, group H would be reluctant to acquire income by inducing infliction of sanctions. Considering the extreme, if there is full compliance by the target, there will not be any reason to induce infliction of sanctions by which the group acquires income. Therefore, the group's marginal utility of income generated by sanctions reduces as the level of compliance increases.

The group H faces the following maximization problem

$$\varphi^H(d) = \max_s u^H(f^H(s), d) \tag{3}$$

The demand function for infliction of sanctions by group H is defined as follows

$$P^s = D^H(s; d) = \frac{\partial u^H}{\partial y^H} \frac{df^H}{ds} \tag{4}$$

where P^S is interpreted as the price of sanctions.[4] According to (4) P^S is the price that group H would be willing to pay to achieve a level of sanctions.

The group utility for B is defined as

$$u^B(y^B) \tag{5}$$

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[3] One could implicitly enter s as an argument in this utility function: i.e.. $u^H(Y^H, s, d)$. In this specification the assumption is that the infliction of sanctions. denoted by s, would directly give satisfaction to the group H. Although this alternative function seems more realistic. it would not change our results. Thus. we use the simpler specification.

[4] We follow Kaempfer and Lowenberg (1988) and Spindler (1995) in this interpretation.

where y^B is the joint income of group B and $u^B_{y^B} > 0$, $u^B_{y^B y^B} < 0$. Assume that, in contrast to group H, the income of group B is negatively affected by sanctions; i.e.,

$$y^B = f^B(s) \tag{6}$$

where $f^B_s < 0$ and $f^B_{ss} = 0$.[5] The group B faces the following maximization problem

$$\varphi^B = \max_s u^B(f^B(s)) \tag{7}$$

based on which, we can derive the following demand function

$$P^S = D^B(s) = -\frac{du^B}{dy^B}\frac{df^B}{ds} \tag{8}$$

where P^S is the price that group B would be willing to pay to reduce sanctions.

Note that D^H is decreasing in s while D^B is increasing in s since $u^H_{y^H y^H} < 0$, $f^H_s > 0$, $f^H_{ss} = 0$, $u^B_{y^B y^B} < 0$, $f^B_s < 0$, and $f^B_{ss} = 0$. Moreover, there is another difference between the demand functions (4) and (8) where the variable d appears in (4) as a shift variable. Since $u^H_{y^H d} < 0$, D^H is decreasing in d. Recall that this asymmetry arises due to our different specification of utility functions for group H and group B, i.e., equations (1) and (5). More specifically, members of group B could not care less about the target's compliance. On the other hand, the utility of group H, whose members include some political activists, is affected by d.

We assume that economic sanctions are set by the sender country, that is, sanctions are unilateral. This assumption seems to be realistic in most of real world situations, where a powerful country usually inflicts sanctions on much less powerful targets. Thus, the strategic variable of the target government is only the variable d. The loss (disutility) function of the target government, the ruling power in the target country, is

$$l^T(s, d) \tag{9}$$

where $l^T_s > 0$, $l^T_d > 0$; i.e., the marginal loss of sanctions and marginal loss of compliance are both positive; l^T is strictly convex, and $\frac{l^T_s(s,0)}{l^T_d(s,0)}\big|_{s>0} = \infty$. The

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[5]One could assume that the group B also includes political activists who oppose the imposition of sanctions. In this case, s could be included as an argument in the their utility function. However, this has little effect on our formulation with literally no effect on our results.

last assumption postulates that the marginal rate of substitution, evaluated at non-compliance with a positive level of sanctions, is very large. That is, a non-compliant target has a very high marginal loss of sanctions and very low marginal loss of compliance. This is in accordance with the standard assumption of diminishing marginal utility in theory of consumer choice.

3   The sanctions game

The game is played in two stages: in the first stage, the target government chooses a level of compliance, $d \in [0, 1]$, while in the second stage, the sender government imposes a level of sanctions, $s \in [0, 1]$. This sequential structure of the game is consistent with empirical observation. That is, first, an (international) incident, caused by the target, often takes place. Then the sender considers imposing sanctions in response. For example, Iraqi accumulation of weapons of mass destruction and use of such weapons against Kurds, followed by invasion of Kuwait, led to infliction of sanctions by UN. As another example, Serbs treatment of other ethnic groups in the Balkans resulted in sanctions against Yugoslavia, the primary supporter of Serbs in the region. Figure 1 depicts this game.

<u>Insert Figure 1</u>

The target payoff is based on the disutility function (9). The payoff function for the sender, on the other hand, is defined by summation of the utility of all pressure groups, that is,

$$u^S = u^H(y^H, d) + u^B(y^B) \tag{10}$$

This specifies the public choice aspect of our formulation and is in accordance with the one-dollar, one vote principle, often used in the literature.

We denote the domestic political equilibrium by the following equation

$$s = \psi(d) \tag{11}$$

where $s' = \psi(d')$ if and only if $D^H(s'; d') = D^B(s')$. Assume that $\tilde{s} = \psi(0) > 0$.[6] Along the equation (11), the domestic political pressures are at the state

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[6]This level of sanctions is the Kaempfer and Lowenberg's (1989) public choice outcome.

of equilibrium since marginal utility of pro-sanctions group and the marginal utility of counter-sanctions group are equal.

The following lemma states that, indeed, the equation (11) is a mandate given to the sender government by the domestic political forces.

Lemma 1: $\forall \, d' \in [0,1]$, the sender government inflicts a level of sanctions s' if and only if $s' = \psi(d')$.

P roof. Note that,$\forall \, d' \in [0,1]$, $s' \in \arg\max\limits_{s} u^S$ if and only if $\frac{\partial u^H}{\partial Y^H}\frac{df^H}{ds} + \frac{du^B}{dY^B}\frac{df^B}{ds} = 0$. That is, $s' \in \arg\max\limits_{s} u^S$ if and only if $D^H(s';d') = D^B(s')$. ■

Intuitively, Lemma 1 states that, for any given level of compliance by target, the sender must balance the combined benefits to pro-sanctions interest group with the harms to anti-sanctions group. From a parallel general equilibrium point of view, the sender chooses a level of sanctions on the "production frontier."

Note that the function ψ characterizes the public choice outcomes. Since infliction of sanctions is a public good (bad), the possibility of free riding exists. Kaempfer and Lowenberg (1989) noted this problem and modified the demand functions.

The following lemma indicates that ψ is a decreasing in d, that is, the sender reduces the level of sanctions if the target increases the level of compliance.

Lemma 2: For any d' and $d'' \in [0,1]$ such that $d'' > d'$, $\psi(d'') < \psi(d')$.

P roof. Recall that for any d', $s' = \psi(d')$ if and only if $D^B(s') = D^H(s';d')$. Also note that $\frac{\partial D^H}{\partial d} < 0$ since $u^H_{y^H d} < 0$ and $f^H_s > 0$. The result follows directly. ■

Intuitively, an increase in the level of compliance of the target country shifts down the demand for sanctions by the pro-sanctions group H, leading to another political market equilibrium with a lower level of sanctions. That is, if the level of compliance by target increases, the imposed level of sanctions goes down. From the general equilibrium point of view, the frontier has the conventional slope. Figure 2 represents this situation, where the original equilibrium is point e' and an increase in d would lead to the equilibrium e''.

Insert Figure 2

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The following result characterizes the equilibrium of our game. It states that, on the one hand, the level of sanctions must be consistent with the mandate given by domestic political forces and, on the other hand, the optimal level of compliance must be pertinent to the lowest disutility achievable given the chosen level of sanctions.

Proposition 3: The strategy profile $\hat{z} = (\hat{s}, \hat{d})$ is a subgame-perfect Nash equilibrium if

(i) $\hat{s} = \psi(\hat{d})$
(ii) $\hat{d} \in \arg \min_{d \in [0,1]} l^T$

P roof. We show this by backward induction. Starting from the second stage, by Lemma 1, $\forall \, \hat{d} \in [0,1]$, the sender government inflicts a level of sanctions $\hat{s}$ if and only if $\hat{s} = \psi(\hat{d})$. At the first stage, the target chooses $\hat{d}$ if and only if $\hat{d} \in \{\arg \min_{d \in [0,1]} l^T \mid \hat{s} = \psi(d)\}$ ∎

Let X be the set of actions; i.e., $X = [0,1] \times [0,1]$. Denote by β the set of actions that minimize l^T, given the behavior of the sender government; i.e., $\beta = \{z \in X \mid z \in \arg \min_X l^T \text{ s.t. } s = \psi(d)\}$. Recall that l^T is a loss function. Figure 3 shows the set β, which are tangency points of target's indifference curve and the equation (11). Note that the set β may not be a singleton.[7]

<div align="center">Insert Figure 3</div>

Lemma 4: For any $z = (s, d) \in \beta$, $d > 0$ and $s < \tilde{s}$.

P roof. Directly from the assumptions on l^T and Lemma 2. ∎

The above lemma assures that at equilibrium the level of compliance is greater than zero, i.e., target complies to some degree, and that the level of sanctions will be milder than the high level of sanctions imposed by sender had there been no compliance by the target country. From the general equilibrium perspective, the solution is not a corner solution.

According to the following lemma, the sender government would be better off as d increases along the mandate ψ. In other words, as target complies, the sender's utility associated with the sancntions-compliance pair along the function ψ increases.

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[7]Note also that. due to continuity of l^T and compactness of X, $\beta \neq \emptyset$. In fact. due to these. the equilibrium. fully characterized by Proposition 3. exists.

Lemma 5: Consider $z' = (s', d')$ and $z'' = (s'', d'')$ such that $s' = \psi(d')$ and $s'' = \psi(d'')$. If $d'' > d'$, then $u^S(z'') > u^S(z')$.

P roof. Recall that the utility function of the sender government, evaluated along the mandate is

$$\lambda(d) = u^H(f^H(\psi(d)), d) + u^B(f^B(\psi(d))) \tag{14}$$

Using the envelope theorem, we get

$$\frac{d\lambda}{dd} = u^H_{y^H} \frac{df^H}{ds} \frac{d\psi}{dd} + u^H_d + u^B_{y^B} \frac{df^B}{ds} \frac{d\psi}{dd} \tag{15}$$

However, since along the mandate ψ we have $u^H_{y^H} \frac{df^H}{ds} + u^B_{y^B} \frac{df^B}{ds} = 0$, (15) reduces to $\frac{d\lambda}{dd} = u^H_d > 0$ ∎

Recall that the pair of strategies $(\tilde{s}, 0)$, defined earlier, is equivalent of Kaempfer and Lowenberg (1988) public choice outcome if one rules out the existence of pressure groups in the target country, as we assumed in our model.[8] The following result makes a comparison between our equilibrium and that of Kaempfer and Lowenberg (1988), as a benchmark.[9]

Proposition 6: Comparing to the public choice outcome $(\tilde{s}, 0)$ (of Kaempfer and Lowenberg (1988)), the target country partially complies and the sender reduces the level of sanctions, leading to an outcome $\hat{z} = (\hat{s}, \hat{d})$ that is Pareto superior to $(\tilde{s}, 0)$, where $\hat{s} < \tilde{s}$ and $\hat{d} > 0$.

P roof. Note that $\hat{d} > 0$ and $\hat{s} < \tilde{s}$ (i.e., target complies and the sender reduces the level of sanctions) due to Lemma 4. To show that $\hat{z} = (\hat{s}, \hat{d})$ is Pareto superior, it is sufficient to show that the sender is better off under $\hat{z}$, which is true due to Lemma 5. ∎

The above result shows that at any equilibrium strategy, the sender inflicts a mild level of sanctions and the target complies moderately. Accordingly, such strategies, which result from our formulation of sanctions game,

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[8] We are aware that Kaempfer and Lowenberg (1988) have analyzed the public choice equilibrium in the target country by assuming existence of pressure groups in target. Therefore. attributing the pair $(\tilde{s}, 0)$ to Kaempfer and Lowenberg (1988) may seem ignorance on our part. However. if one does not assume the existence of pressure groups in the target country. the public choice of Kaempfer and Lowenberg (1988) reduces to $(\tilde{s}, 0)$.

[9] We realize that the level of compliance associated with Kaempfer and Lowenberg's equilibrium may be greater than zero. One then could view our point of comparison. as such a constant positive level of compliance. being normalized to zero.

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Pareto dominate the public choice outcome (of Kaempfer and Lowenberg), where strategic aspect of the problem is absent.[10] This result has important policy implications regarding the design of economic sanctions. It supports the idea that tough sanctions are not effective in bringing any changes in target country's behavior. This may explain the lack of compliance by the former Iraqi regime in the recent sanctions case imposed by the United Nations. On the other hand, it suggests that a carrot and stick approach to economic sanctions is a more effective way of conflict resolution.

4 Concluding remarks

We bridged the gap between the strategic approach to economic sanctions and the public choice model of sanctions, pressure groups, and internal political equilibrium (Kaempfer and Lowenberg, 1988). Therefore, our sanctions game differs from that of Eaton and Engers (1992), where we incorporated the domestic political equilibrium. On the other hand, we included the interaction of the target country with the sender country into our game, which differentiates our model from Kaempfer and Lowenberg (1988).

We have shown that the sender government goes to negotiation table with a mandate in hand, given by domestic political forces. We illustrated that the target government partially complies and the sender government eases economic sanctions. We also demonstrated that these outcomes are Pareto superior to the non-compliance and tough economic sanctions, resulted from the public choice outcome of Kaempfer and Lowenberg (1988). We have shown how a carrot and stick approach to economic sanctions could be more effective in inducing compliance by the target countries than tough economic sanctions.

The model introduced in this paper can be extended in a number of directions. One line of investigation concerns the formulation of the interaction of the pressure groups (among themselves) instead of the public choice framework. Alternatively, one could introduce the pressure groups in the target country. Although, the existence of influential and opposing pressure groups in the target countries is questionable in the most real world cases, one could think of a few instances to support such idea, e.g., the events in Yugoslavia.

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[10]Note that although Kaempfer and Lowenberg (1988) solve the public choice problems for both sender and target separately. they did not take into account the strategic aspect of the issue which we believe is a "must" in the analysis of sanctions.

Of course, these would be interesting topics for future research in this area.

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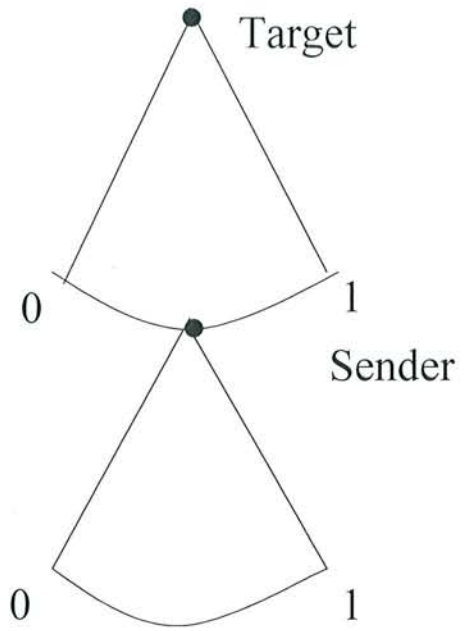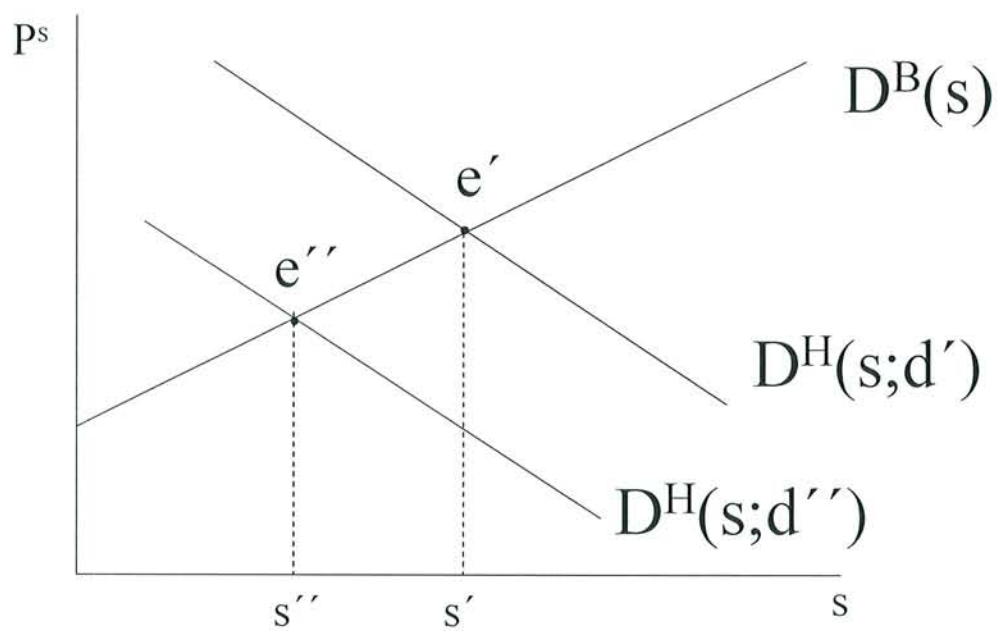
Figure 1: Sanctions game
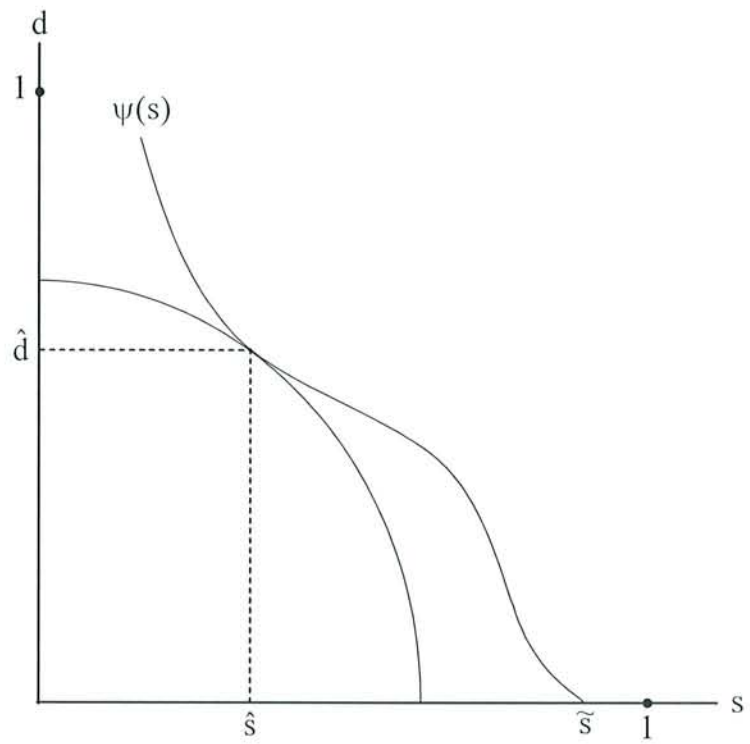
Figure 2: The impact of an increase in compliance

Figure 3: Equilibrium