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Is the good news about compliance good news about cooperation?

George W. Downs, David M. Rocke,
and Peter N. Barsoom

In the past few years many social scientists interested in cooperation have turned their attention to the problem of compliance in international regulatory regimes. Much of the empirical research in this area has been conducted by a group composed mainly of qualitative political scientists and scholars interested in international law.¹ Its message is that (1) compliance is generally quite good; (2) this high level of compliance has been achieved with little attention to enforcement; (3) those compliance problems that do exist are best addressed as management rather than enforcement problems; and (4) the management rather than the enforcement approach holds the key to the evolution of future regulatory cooperation in the international system. As Oran Young notes, "A new understanding of the bases of compliance—one that treats compliance as a management problem rather than an enforcement problem and that has profound practical as well as theoretical implications—is making itself felt among students of international relations."² In short, not only are the dreary expectations born of factors such as relative gains concerns, collective action problems, anarchy, and fears of self-interested exploitation incorrect but also the enforcement limitations that always have appeared to sharply bound the contributions of international law and many international institutions now appear to have been exaggerated.

In this essay we will argue that the empirical findings of this group, which we refer to as the "managerial" school, are interesting and important but that its

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1. For example, see Arora and Cason 1995; Chayes and Chayes 1990; 1991; 1993a; 1993b; Duffy 1988; Haas, Keohane, and Levy 1993; Hawkins 1984; Mitchell 1993; 1994a; 1994b; 1995; Scholz 1984; Sparrow 1994; Young 1989; and 1994.

2. Young's quotation is taken from the dust jacket of Mitchell 1994a.

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policy inferences are dangerously contaminated by selection problems. If we restrict our attention to those regulatory treaties that prescribe reductions in a collectively dysfunctional behavior (e.g., tariffs, arms increases), evidence suggests that the high level of compliance and the marginality of enforcement result from the fact that most treaties require states to make only modest departures from what they would have done in the absence of an agreement. This creates a situation where states often are presented with negligible benefits for even unpunished defections; hence the amount of enforcement needed to maintain cooperation is modest. Nothing is wrong with this situation in itself, but it is unlikely to provide the model for the future that the managerialists claim. Even if we assume that the absolute value of the benefits generated by this small amount of regulation is relatively large, further progress in international regulatory cooperation will almost certainly require the creation of agreements that present far greater incentives to defect than those currently in place (e.g., more demanding environmental standards, fewer nontariff barriers, steeper arms reductions). We have precious little evidence that such progress can be obtained in the absence of better enforcement.

After discussing the problems posed by endogeneity and selection, we present the theoretical argument for linking enforcement level to what we call "depth of cooperation"; and examine the extent to which deep cooperation has been achieved without enforcement. We then present a number of prominent exceptions to the managerial school's unqualified generalizations about the causes and cures of noncompliance. Finally, we discuss the strategic implications of the evolution of increasingly cooperative regimes.

The managerial thesis

The bedrock of the managerial school is the finding that state compliance with international agreements is generally quite good and that enforcement has played little or no role in achieving and maintaining that record. In Abram Chayes and Antonia Chayes's words, what ensures compliance is not the threat of punishment but "a plastic process of interaction among the parties concerned in which the effort is to reestablish, in the microcontext of the particular dispute, the balance of advantage that brought the agreement into existence."³ For the members of the managerial school, "noncompliance is not necessarily, perhaps not even usually, the result of deliberate defiance of the legal standard."⁴ On those rare occasions when compliance problems do occur they should not be viewed as violations or self-interested attempts at exploitation, but as isolated administrative breakdowns. The causes of noncompliance are to be found in (1) the ambiguity and indeterminacy of treaties, (2) the

3. Chayes and Chayes 1991, 303.

4. *Ibid.*, 301.

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capacity limitations of states, and (3) uncontrollable social or economic changes.⁵

Not surprisingly, the managerial school takes a dim view of formal and even informal enforcement measures. Punishment not only is inappropriate given the absence of any exploitative intent but it is too costly, too political, and too coercive. As Ronald Mitchell notes, "Retaliatory non-compliance often proves unlikely because the costs of any individual violation may not warrant a response and it cannot be specifically targeted, imposing costs on those that have consistently complied without hurting the targeted violator enough to change its behavior."⁶ As a result, according to Young, "arrangements featuring enforcement as a means of eliciting compliance are not of much use in international society."⁷ Since sanctions usually are more successful against economically vulnerable and politically weak countries and "unilateral sanctions can be imposed only by the major powers, their legitimacy as a device for treaty enforcement is deeply suspect," as Chayes and Chayes point out.⁸ Moreover, retaliation for violating a treaty may risk the breakdown of current and future cooperation:

the actor considering *retaliation* must also think of the possible future costs. It may be dangerous to prejudice the possibility of support from the violator at some point in time in the future when it may be needed. . . . [T]he risk of setting off "a long echo of alternating retaliations" will often dwarf the consequences of overlooking what are arguably relatively minor or "technical" violations.⁹

Instances of apparent noncompliance are problems to be solved, rather than violations that have to be punished. According to Chayes and Chayes, "As in other managerial situations, the dominant atmosphere is that of actors engaged in a cooperative venture, in which performance that seems for some reason unsatisfactory represents a problem to be solved by mutual consultation and analysis, rather than an offense to be punished. Persuasion and argument are the principal motors of this process."¹⁰ The strategies necessary to induce compliance and maintain cooperation involve: (1) improving dispute resolution procedures, (2) technical and financial assistance, and (3) increasing transparency. The last is especially important: "For a party deliberately contemplating violation, the high probability of discovery reduces the expected benefits rather than increasing the costs and would thus deter violation regardless of the prospect of sanctions."¹¹

5. Chayes and Chayes 1993b, 188.

6. Mitchell 1993, 330.

7. Young 1994, 74 and 134.

8. Chayes and Chayes 1993a, 29.

9. Ibid. The authors quote Robert Axelrod, *The Evolution of Cooperation* (New York: Basic Books, 1984), emphasis original.

10. Chayes and Chayes 1991, 303.

11. Chayes and Chayes 1993a, 18.

The endogeneity and selection problems

It is not difficult to appreciate why the findings of the managerial school suggest that both international institutions and even international law have a far brighter future than most international relations specialists have believed for the past fifty years. Apart from sharply contradicting the pessimistic expectations of many realists and neorealists about the inability of cooperation and self-regulation to flourish in an anarchic world, they also run counter to the claims of cooperation researchers in the rational-choice tradition. Such researchers emphasize the centrality of enforcement concerns in regulatory environments and characterize them as mixed-motive games, where the danger of self-interested exploitation is significant, as opposed to coordination games, where it is not.¹² Such findings certainly add credibility to the frequent speculation that the rational-choice tradition's affection for the repeated prisoners' dilemma has led it to overemphasize enforcement and underemphasize the potential for voluntary compliance and noncoercive dispute resolution.

In trying to understand the prescriptive significance of the managerialists' compliance findings, it is useful to consider the following hypothetical story. An article has recently appeared in an education journal criticizing the state of musical education in an age of funding cutbacks. The author, a longtime music teacher, argues that such cutbacks inevitably have dire consequences for the quality of school music programs. A member of the school board who has aggressively supported the elimination of frivolous expenditures is skeptical of what she believes to be characteristically self-interested reasoning. In an effort to get to the bottom of the issue, she attends fifteen concerts in her district and fifteen concerts in a rival district that has not reduced its support of music education or extracurricular activities. She finds that the quality of the two orchestras as measured by the number of mistakes they made to be pretty much the same and quite low in both cases. Noting that the orchestras in her district have achieved this high level of performance despite a 75 percent reduction in the number of rehearsals, she is delighted. Not only has she demonstrated that the cutbacks have had no effect on school orchestras but she believes that she has confirmed her long-held suspicion that rehearsals do not make school orchestras better, they simply line the pockets of music teachers eager to buy hot tubs and Steinway pianos.

These conclusions may, however, be invalid. It is likely that orchestras in her district may have adapted to the decrease in resources by playing less demanding pieces. No orchestra is eager to embarrass itself, and one of the most effective ways to avoid doing so is to play Haydn rather than Mahler or Stravinsky. Unless the school board member counting mistakes figures out a way to control for the difficulty of repertoire, we do not really know what her

12. See, for example, Abreu 1988; Abreu, Pearce, and Stacchetti 1986; 1989; Bayard and Elliott 1994; Downs and Rocke 1995; Hungerford 1991; Martin 1992; Staiger 1995; and Sykes 1990.

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findings tell us about the impact of the budget cuts. A treaty, like the selection of an orchestra's repertoire, is also an endogenous strategy. States choose the treaties they make from an infinitely large set of possible treaties. If some treaties are more likely to be complied with than others or require more enforcement than others, this will almost certainly affect the choices states make. Just as orchestras will usually avoid music that they cannot play fairly well, states will rarely spend a great deal of time and effort negotiating agreements that will continually be violated. This inevitably places limitations on the inferences we can make from compliance data alone. As in the case of the orchestra's mistakes, we do not know what a high compliance rate really implies. Does it mean that even in the absence of enforcement states will comply with any agreement from the set of all possible agreements, or does it mean that states only make agreements that do not require much enforcement? If the latter is the case, what are the implications for the future of regulatory cooperation?

To even begin to overcome the problems that endogeneity poses for understanding the role of enforcement in regulatory compliance, we need to control for the basis of state selection; that is, those characteristics of international agreements that play the same role for states as musical difficulty does for the school orchestras. One likely candidate is what we have termed the depth of cooperation. International political economists define the depth of an agreement by the extent to which it requires behind-the-border integration with regard to social and environmental standards as well as with regard to the reduction of barriers to trade. Here, however, the depth of an agreement refers to the extent to which it captures the collective benefits that are available through perfect cooperation in one particular policy area. Given the difficulties involved in identifying the cooperative potential of an ideal treaty, it is most useful to think of a treaty's depth of cooperation as the extent to which it requires states to depart from what they would have done in its absence. If we are examining the critical subset of regulatory treaties that require states to reduce some collectively dysfunctional behavior like tariffs or pollution, a treaty's theoretical depth of cooperation would refer to the reduction it required relative to a counterfactual estimate of the tariff or pollution level that would exist in the absence of a treaty. Of course, the depth of cooperation that a treaty actually achieved might be quite different than this figure. Here we measure depth of cooperation by the treaty level because that is the figure which serves as the basis for judging the level of compliance. In the absence of a trustworthy theoretical estimate of this counterfactual, it could be based on the status quo at the time an agreement was signed or on a prediction derived from the year-to-year change rate prior to that time.

Either estimate of depth of cooperation is obviously quite crude. There are doubtless policy areas in which, for any number of reasons, the potential for cooperation is much smaller than others. In such cases our depth measure will make cooperation in these areas appear shallower than it really is. Yet if one is

willing to concede, as both managerialists and more conventional institutionalists argue, that there are substantial cooperative benefits that are as yet unrealized in the areas of arms control, trade, and environmental regulation, this depth of cooperation measure provides a rough idea of what states have accomplished. We can in turn use it to interpret compliance data and help assess the role of enforcement. While this measure of depth is hardly perfect, there is no reason to expect that it is biased in such a way as to distort the relationship between the depth of cooperation represented by a given treaty, the nature of the game that underlies it, and the amount of enforcement needed to maintain it.

Depth of cooperation is important to track because just as the role of enforcement differs in mixed-motive and coordination games, it also varies within mixed-motive games according to depth. To appreciate the connection, consider the following model. States A and B are playing a repeated bilateral trade game in which each state in each period chooses a level of protection $P \in [0, \infty)$ that influences the level of trade. The utility of state A is denoted as $U_A(P^A, P^B)$, and the utility of state B is denoted as $U_B(P^A, P^B)$. We do not specify the functional form of these utilities but instead adopt a series of plausible assumptions detailed in Appendix A.¹³

We will adopt the convention of representing the trade game as a prisoners' dilemma. While some have argued that this pattern of incentives emerges from a variety of plausible circumstances, we assume it has emerged from electoral and financial incentives provided by interest groups working to protect domestic products from foreign competition.¹⁴ If we consider only two particular levels of tariffs $P^A < P_0^A$ and $P^B < P_0^B$, then the four outcomes represented by each side choosing P or P_0 form a payoff matrix of the prisoners' dilemma type. In this case, each side prefers higher tariffs regardless of the choice of the other side, but both sides prefer mutual cooperation to mutual defection. Unlike the repeated prisoners' dilemma, the choices defined by the present model are continuous rather than discrete. Treaties can be set at any level below the noncooperative tariff rates. Cheating can be limited or flagrant. And punishments can range from a barely perceptible increase in tariffs that lasts for one period to a multiple of current tariffs that lasts indefinitely.

Under the assumptions of our model, if tariff levels are high, both states have an opportunity to benefit by devising an agreement to lower them. Nevertheless, there is an incentive to exploit the other party's trust; that is, A's optimal one-period response to side B's cooperative tariff level will always be to raise tariffs. Self-interest will prevent such cheating only if the consequences of cheating are greater than the benefits. To achieve a situation where this

13. These assumptions also contain conditions on the response functions $R_A(P_B)$ and $R_B(P_A)$, which denote the optimal single-period response of one state to a particular level of protection (e.g., tariff) chosen by the other state.

14. For the former argument, see Staiger 1995, 27. For the latter, see Grossman and Helpman 1994.

FIGURE 1
disincentive case, one party may benefit from a treaty, but if the agreement is not specified in advance, the parties are supposed to be in a noncooperative equilibrium. In periods both sides choose to defect, the punishment response to a defection is a return to the equilibrium. If one side knows the other's net benefit will be lower, it will not defect. To make the treaty a tariff is at a level that provides for a net benefit over the one-period defect. The threat of punishment imposes a level of punishment

15. Of course the discount factor, $\delta = .95$, corresponds to a

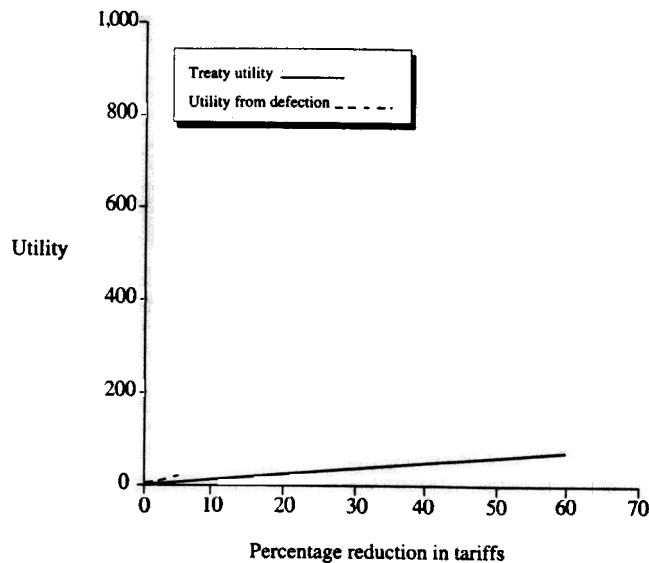


FIGURE 1. One-period utility of treaty compliance versus defection

disincentive exists, states must resort to a punishment for defection. In this case, one punishment strategy prescribes that state A begin by observing the treaty, but if B violates it, even modestly, state A should respond by abrogating the agreement (or otherwise reducing its level of compliance) for some specified period of time. During cooperative periods each side's tariff is supposed to be limited to $\bar{P}^A < P_0^A$ and $\bar{P}^B < P_0^B$, while in the punishment periods both sides raise tariffs to some noncooperative level. The most extreme punishment strategy, often called the "grim strategy," occurs when the response to any violation is permanent reversion to the noncooperative Nash equilibrium. A punishment strategy is sufficient to enforce a treaty when each side knows that if it cheats it will suffer enough from the punishment that the net benefit will not be positive.

To make this more concrete, consider an example where the noncooperative tariff is at a level of 100 percent for each side, and plausible treaties would provide for symmetric reductions in tariffs for each side.¹⁵ Figure 1 compares the one-period utility of both sides observing the treaty with the temptation to defect. The temptation to cheat in this model rises rapidly with the cooperativeness of the treaty, while the treaty benefits rise less rapidly. This is what imposes a limit on which treaties can be supported. Figure 2 shows the punishment periods necessary to support treaties of various sizes. A shorter

15. Of course, in the multiperiod model, the feasibility of maintaining this treaty depends on the discount factor, δ , as well as on the previous parameters. In this case, we use a discount factor of $\delta = .95$, corresponding to an interest rate of 5 percent.

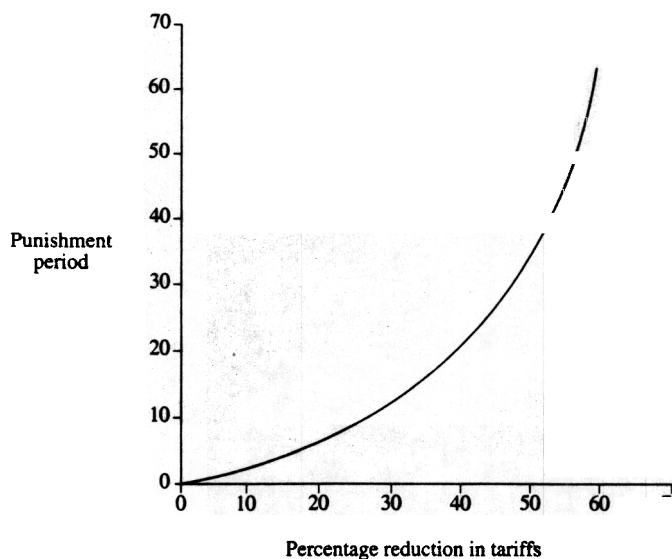


FIGURE 2. *Punishment required to support treaties of various sizes*

period would make the treaty vulnerable to cheating because it would be insufficient to remove all of the gains from violating the treaty. For example, a treaty that specifies a 5 percent reduction in tariffs only requires a punishment of two periods; the best treaty that can be supported with the maximal punishment of infinite duration is 37.19 percent. The increase in the ratio of the benefit of cheating to the benefit of cooperating means that increasingly severe punishments are necessary to deter defection—here severity means length of punishment—as the benefits of the treaty and corresponding restrictiveness of its requirements increase. Although the rate of increase in utility with the increase in punishment length decreases, the utility obtainable by very long punishments is still many times that of the utility obtainable with punishment lengths of one or two periods. The essential point the graph demonstrates is the deeper the agreement is, the greater the punishments required to support it.

The only relevant criterion is that the punishment must hurt the transgressor state at least as much as that state could gain by the violation. This does not imply that, say, a certain amount of trade restriction should be punished by an equal trade restriction (tit-for-tat); nor does it mean that the transgressor be punished at least as much as the transgressor's violation hurt the other party. Although both of these standards possess aspects of fairness, neither is relevant to supporting the treaty equilibrium. Fairness and justice must take a back seat to the correct disincentive.

The specific mechanism by which states punish violations is less relevant to the relationship between depth of cooperation and enforcement than is the magnitude of enforcement. Although we motivate the model by using a case of

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centralized enforcement for convenience, nothing in the analysis precludes effective decentralized enforcement schemes. Enforcement can occur through linkages, as in the case of the Soviet Union and United States during the Kissinger years; through formal institutions such as the General Agreement on Tariffs and Trade (GATT) Dispute Settlement Procedure; through unilateral actions, as in the U.S. enforcement of fishery and wildlife agreements under the Pelly and Packwood-Magnuson amendments; or by domestic law as in the European Union and environmental treaties. Given the weakness of current international institutions and the relative difficulty in mobilizing formal sanctions, we suspect—like the majority of managerialists—that the most effective enforcement schemes may well be decentralized and not involve perfectly coordinated action by every signatory of a multilateral agreement.¹⁶ This, however, does not negate the connection between depth of cooperation and the magnitude of the punishment necessary to maintain compliance in mixed-motive games.

Discussion

This logical connection between the depth of cooperation represented by a given treaty and the amount of enforcement that is needed in mixed-motive games suggests that evaluating the importance of enforcement by examining how high compliance is when it is low or absent might be misleading. We need to worry about the possibility that both the high rate of compliance and relative absence of enforcement threats are due not so much to the irrelevance of enforcement as to the fact that states are avoiding deep cooperation—and the benefits it holds whenever a prisoners' dilemma situation exists—because they are unwilling or unable to pay the costs of enforcement. If this were true, prescribing that states ignore enforcement in favor of other compliance strategies would be equivalent to telling the school orchestras to avoid wasting their time rehearsing. Just as the latter would condemn the orchestras to a repertoire of simple compositions, the prescriptions of the managerial school would condemn states to making agreements that represent solutions to coordination games and shallow prisoners' dilemmas.

Of course, knowing that statistics about the role of enforcement might be misleading is hardly equivalent to establishing its importance as a compliance strategy. If members of the managerial school are correct in believing in their (usually implicit) assumption that mixed-motive games and prisoners' dilemmas play a much smaller role in critical regulatory arenas than game theorists assume, the argument fizzles. Unfortunately, settling this controversy is no easy matter. Utility functions are notoriously difficult to access directly and any attempt to cope with selection by estimating the character of the set of

16. On the role of decentralized enforcement schemes, see Ostrom 1990; and Kandori 1992.

regulatory agreements that are potentially possible would be hopelessly circular.

Given the circumstances, it seems advisable to sidestep any attempt to inventory the nature of the underlying game and to evaluate some of the implications of the rival theories. We examine two. First, we will assess the depth of cooperation and the level of enforcement connected with prominent regulatory agreements that involve the reduction of behaviors that states have concluded are collectively counterproductive but that contain few enforcement provisions. Ideally, one would like to examine the correlation between enforcement and depth of cooperation, but as we noted above, we agree with the managerial school's observation that such strongly enforced regulatory agreements are relatively rare. If the managerial school is correct, the absence of strong enforcement provisions or the informal threat of enforcement should have no bearing on the depth of cooperation. There should be numerous examples of states agreeing to alter dramatically the trajectory that they were following at the time a treaty was signed while paying little attention to enforcement. If the game theorists are correct that most important regulatory agreements are mixed-motive games of some variety, any tendency of states to avoid committing themselves to punishing noncompliance is likely to be associated with either a world in which there are relatively few deeply cooperative agreements or in which violations run rampant. Since we agree that while regulatory violations exist they are not frequent, we expect the former to be true.

Second, we will examine the managerial school's claim that self-interest rarely plays a conspicuous role in the treaty violations that do take place and that violations are driven instead solely by a combination of the ambiguity of treaties, the capacity limitations of states, and uncontrollable social and economic changes. We are skeptical of this assertion because the set of violations should be less distorted by selection than the set of treaties. This is true because we expect that, *ceteris paribus*, the rate of violation connected with mixed-motive game treaties should in the absence of perfect information and appropriate enforcement be much higher than the rate of violation connected with coordination game treaties. Hence, even if there are fewer such treaties they would be overrepresented relative to coordination game based-treaties in any sample of violations.

The rarity of deep cooperation

Are we correct in our suspicion that inferences about the importance of enforcement are likely to be contaminated by selection? That is, does evidence show that there is little need for enforcement because there is little deep cooperation? Let us begin by considering the set of arms agreements that the United States has made since 1945 (see appendix B). We note at the outset that, however valuable, a number of the treaties such as the "Hot Line"

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agreement and the United States–Union of Soviet Socialist Republics Ballistic Missile Launch Notification Agreements do not directly regulate an arms output such as the number and/or location of a weapons system. Of those that do, a significant subset such as the Outer Space Treaty, the Seabed Arms Control Treaty, and the Antarctic Treaty involve agreements to maintain the status quo trajectory rather than to alter it significantly. At the time the treaties were signed, neither the Soviet Union nor the United States had cost-effective plans for major weapons systems in these areas or possessed a strategic mission for which such a system was believed necessary. The fact that this situation has basically continued is the reason Chayes and Chayes can report that “there has been no reported deviation from the requirements of these treaties over a period of four decades.”¹⁷ That there was more enforcement in this case than officially is embodied in these agreements might also play a role. Both the Soviet Union and the United States likely knew that if one broke an agreement in a dramatic fashion, the other probably would retaliate in kind. Even though these expectations were established tacitly, they are no less real than expectations described formally in the treaty.¹⁸ While we are not denying that obtaining tangible reassurance of a rival’s intentions through a treaty is valuable, it is difficult to argue that these treaties exhibit the deep cooperation that would have taken place if the superpowers had each agreed to terminate major modernization programs or dramatically reduce their defense budgets. Much the same argument can be made in connection with the Anti-Ballistic Missiles (ABM) Treaty. While the treaty may have provided a significant benchmark that helped prevent both states from exploiting the technological gains that were made during the period since the treaty was signed, neither side had the technology or the budget to deploy a major system when the treaty was signed in 1972. In 1967 when President Johnson and Premier Kosygin first began to move toward discussion, Soviet ABM efforts were limited to a spare system around Moscow and the United States announced that it would begin deployment of a “thin” system to guard against Chinese attack and possible accidental launches.¹⁹ As the technology of these antiballistic systems gradually has advanced and attention has shifted away from defense against a terrorist state, the depth of the original agreement in terms of today’s “counterfactual” (i.e., the ABM system that the United States would construct today in the absence of an agreement) probably has increased. Given a constant or decreasing level of enforcement because of the weakness of the former Soviet Union and increasing depth, the game theorist would expect the agreement to come under increasing pressure in the form of violations on the part of the most powerful state. This appears to have occurred.

17. Chayes and Chayes 1993a, chap. 7, p. 9.

18. Downs and Rocke 1990.

19. Arms Control and Disarmament Agency 1990, 150.

Neither the initial Strategic Arms Limitation Talks (SALT) Interim Agreement nor SALT II was characterized by much depth. The interim agreement froze the number of intercontinental ballistic missile (ICBM) launchers at the status quo level (the United States had none under construction at the time and the Soviet Union was permitted to complete those it was building), but it allowed increases in the number of submarine-launched ballistic missiles (SLBMs) on both sides and failed significantly to restrict qualitative improvements in launchers, missiles, or a host of systems that allowed both sides to increase their nuclear capabilities.²⁰ SALT II required significant reductions in each side's number of operational launchers or bombers but permitted the number of ICBMs equipped with multiple independently targeted reentry vehicles (MIRVed ICBMs) to increase by forty percent between the time of signing and 1985. When this figure is added to the number of cruise missiles permitted each bomber, the total number of nuclear weapons was allowed to increase 50–70 percent. As Jozef Goldblat notes, "There is a remarkable compatibility between the Treaty limitations and the projected strategic nuclear weapons programs of both sides."²¹

Intermediate-range nuclear forces (INF), conventional forces in Europe (CFE), and the strategic arms reduction talks (START) agreements are deeper, of course. The first prescribes the elimination of intermediate- and shorter-range missiles in Europe; the second dramatically reduced conventional forces; and the third cuts the arsenals of strategic nuclear delivery vehicles that come under the agreement by about 30 percent and cuts warheads by 40 percent.²² While one can argue in connection with START that the number of accountable weapons is smaller than the actual number of weapons, the cuts are significant in terms of either the status quo at the time of signing and each state's trajectory. Do these suggest that deep agreements that make no provisions for enforcement play an important role in arms control?

There is no easy answer. On the one hand, we are inclined to simply include these agreements in the set of deep regulatory agreements that seem to require little enforcement. We do not claim that such agreements do not exist—they clearly do—simply that many important prospective agreements require enforcement. Yet, it is not clear that these agreements are as deep as they appear to be. After all, the counterfactual—whether estimated on the basis of the status quo or the trajectory of year to year differences in arms production—represents the behavior of a political system that no longer exists. No one would gauge the depth of cooperation represented by the North Atlantic Treaty Organization (NATO) by comparing German behavior during wartime with German behavior after the war.

20. *Ibid.*, 168.

21. Goldblat 1993, 35.

22. Arms Control and Disarmament Agency 1991.

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24. Murdoch

25. The quo

Managerialists might respond to this analysis by arguing that there are good reasons for believing that the connection between enforcement and depth of cooperation in the areas of international trade and the environment is different from that connection in security. Not only are many of the actors obviously different but security historically has been dominated by the realist logic that managerialists find so inadequate. We are not unsympathetic to this argument. The dynamics of cooperation may indeed differ across policy areas, just as they may vary within the same policy area over time. Nonetheless, at least with respect to the relationship between enforcement and depth of cooperation, the areas are not as different as one might imagine or as some might hope.

Recent environmental agreements to control transboundary pollution, for instance, exhibit a similar lack of depth. Despite the apparently large cutbacks in chlorofluorocarbon (CFC) emissions, the Montreal Protocol provided few benefits to cooperation and little incentive to defect from the agreement. Scott Barrett has argued that "the Montreal Protocol may not have increased global net benefits substantially compared with the noncooperative outcome."²³ In their extensive empirical analysis, James Murdoch and Todd Sandler have similarly concluded that "the Montreal Protocol was enacted because it codified reductions in CFC emissions that polluters were voluntarily prepared to accomplish. . . . [T]he Montreal Protocol may be more symbolic than a true instance of a cooperative equilibrium."²⁴ In fact, most of the cutbacks in emissions preceded the ratification of the Montreal Protocol.

Perhaps the best test of the relationship between the depth of cooperation and enforcement can be found when we examine the history of a specific policy area in which regulations have become increasingly strict over time. The game theorist would predict that as regulatory rules tighten, the magnitude of the punishment needed to deter defection would also have to increase. Even if the system achieves some dynamic equilibrium, there should be some tangible sign of this under imperfect information.

If we discount the events that occurred in arms control after the downfall of the Soviet empire, the best examples of steadily increasing depth of cooperation are to be found in the areas of trade and European integration. In each case the role of enforcement has increased accordingly. Thomas Bayard and Kimberly Elliott, for example, conclude that the Uruguay Round has "substantially reduced many of the most egregious trade barriers around the world," but they also emphasize the enhanced ability of the World Trade Organization (WTO) to respond to and punish trade violations.²⁵ The WTO's procedures for dealing with violations are now more automatic and less manipulable by individual parties. Time limits on the establishment of panels have now been

23. Barrett 1994, 892.

24. Murdoch and Sandler 1994, 2.

25. The quotation is from Bayard and Elliott 1994, 336.

set to nine months with the conclusion of panels within eighteen months, eliminating the inexorable delays under GATT. The principle of consensus voting in the adoption of panel reports has been reversed; previously, both parties to a dispute had an automatic veto on panel recommendations and retaliation. The new system provides for automatic adoption of panel reports, including approval for retaliation, unless a unanimous consensus rejects it. Previously, sanctions were utilized only once in GATT's history. Now, retaliation will be authorized automatically in the absence of a withdrawal of the offending practice or compensation to the defendant. We believe that the negotiating history of the WTO demonstrates that the more demanding levels of cooperation achieved by the Uruguay Round would not have been possible without its having reduced the likelihood of self-interested exploitation by member states.

The deepening of European integration exhibits a similar pattern. Simultaneous with the increased cooperation embodied in the Maastricht Treaty, Anne-Marie Burley and Walter Mattli point out with regard to the European Court of Justice that "the member states chose to strengthen the Court's power to monitor and punish defections."²⁶ In the European case, enforcement took the form of penetration of European Community (EC) law into the domestic law of its members states.²⁷ It is difficult to believe that this increased enforcement represents nothing more than an attempt to pacify the few naive realists who remain influential in member states.

The causes and cures of noncompliance

The principal goal of the managerial school's investigation of compliance is to design more effective strategies for overcoming compliance problems in regulatory regimes. It is thus useful to shift our attention away from the likelihood of selection and the relationship between depth of cooperation and enforcement to why those compliance problems that do exist have occurred and how they might be remedied.

As noted above, selection bias should affect an examination of the reasons that compliance problems arise and their solutions less than it would an analysis of which type of cooperative agreements exist. We will briefly consider, first, the extent to which compliance problems appear to be caused by the ambiguity of treaties, the capacity limitations of states, and uncontrollable social and economic changes rather than the calculation of states bent on exploiting other states, as the managerial school alleges; and, second, extent to which compliance problems appear to be solved by improving dispute resolution procedures, technical and financial assistance, and transparency without any attention to increased enforcement.

26. Burley and Mattli 1993, 74.

27. *Ibid.*, 43.

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Scholars in the field of arms control agree that the Washington Naval Treaty of 1923 not only was the most pathbreaking and ambitious arms control agreement ever formulated but also experienced the most compliance problems. For example, the treaty permitted the conversion of battle cruisers into aircraft carriers up to a maximum of 33,000 tons, yet both the U.S.S. *Lexington* and *Saratoga* were closer to 36,000 tons. For their part as Robert Kaufman notes, the Japanese "broke the rules seriously, systematically, and often clandestinely."²⁸ Emily Goldman reports that its cruiser *Atago* exceeded its announced size by 20 percent, and its *Yamato* was 95 percent heavier than announced and carried eighteen-inch rather than sixteen-inch guns. Italy's *Gloriza* exceeded its announced size by 20 percent.²⁹ To what extent were these problems attributable to the ambiguity of the treaty, the capacity limitations of the states, or uncontrollable social and economic changes?

Ambiguity was certainly a problem, especially with regard to the extent to which the Japanese violated their commitment not to build fortifications on the Mandates. The treaty left terms like "naval base" and "fortification" undefined. However, ambiguity in some areas does not detract from the purposefulness and exploitative character of the violations in other areas, such as shipbuilding. Both Kaufman and Goldman provide overwhelming evidence that more than confusion over treaty parameters was behind the treaty violations on the part of all parties during the interwar years. It would be even more implausible to attribute the myriad violations to capacity limitations or the sort of uncontrollable social and economic changes that are usually covered by the *rebus sic stantibus* standard.

Since the pattern of violations that plagued the Washington Treaty never was brought under control, any analysis of how control might have been achieved is entirely speculative. It is difficult to imagine, however, that it could have occurred purely through dispute resolution; and technical and financial assistance to the violator is not relevant. Mechanisms to increase transparency certainly could have played a more active and important role. Kaufman argues that the United States failed to detect most of Japan's violations. He goes on to say that "Domestic politics inhibited effective response to those violations about which the American public officials had full knowledge or at least some suspicions."³⁰ Kaufman is not specific about the response he has in mind, but it appears likely that he is referring to the administration's lack of appetite for retaliation rather than the mere initiation of some dispute settlement procedure. This is hardly surprising. As Fred Ikle pointed out in his classic article, "After Detection—What?" the importance of transparency almost inevitably lies in the reaction that it provokes.³¹ This reaction is, of course, the substance of enforcement.

28. Kaufman 1990.

29. Goldman 1994.

30. Kaufman 1990, 102.

31. Ikle 1961.

As the centerpiece of a sometimes problematic postwar trade regime, the GATT provides researchers with a wealth of material about the sources of noncompliance and the ability of its signatories to deal with them. Typical examples of GATT violations include EC payments and subsidies to oilseed producers, U.S. quantitative restrictions on sugar, Japanese import restrictions on beef and citrus, and Canadian export restrictions on unprocessed salmon and herring.³² This is just a sample of the long list of commonly employed discriminatory techniques states have used to satisfy protectionist political elements in contravention of the GATT's rules and norms.

Ambiguity about what constitutes noncompliance is a source of some of these problems, but no one denies a considerable number of violations indeed has occurred. The framers of the GATT were careful not to limit its policing or dispute settlement procedures to actions that were prohibited explicitly. Instead, they based enforcement provisions on the nullification or impairment of benefits that countries might expect. Indeed, Article 23 permits that settlement procedures be initiated

If any contracting party should consider that any benefit accruing to it directly or indirectly under this agreement is being nullified or impaired or that the attainment of any objective of the agreement is being impeded as the result of (a) the failure of another contracting party to carry out its obligations under this Agreement, or (b) the application by another contracting party of any measure, whether or not it conflicts with the provisions of this Agreement, or (c) the existence of any other situation.³³

Although variation in expectations doubtless exists, few parties—including the states responsible—have argued that the EC subsidies of wheat flour or pasta or the Multifiber Agreement, which clearly violated the most-favored nation (MFN) principle, were based on confusion about the expectations of other trading partners.

Capacity limitations and uncontrollable social and economic changes rarely are cited as major determinants of violations. This is not so much because they are never present but because their effect is dwarfed by the most conspicuous cause of GATT noncompliance: the demands of domestic interest groups and the significant political benefits often associated with protection. Though GATT supporters would argue that any ill effects have been overshadowed by the GATT's positive achievement of reducing tariffs, the demand for protection is not being entirely ignored.

If the managerialists are wrong about the source of the GATT's problems, are they correct about the steps that appear to have reduced the rate of violations? The GATT provides a better laboratory for evaluating the managerialist claims about how compliance can best be improved than the Washington

32. See, respectively, Hudec 1993, 559 and 568; Bayard and Elliott 1994, 233; and Hudec 1993, 217–19.

33. The article is quoted in Bhagwati 1990, 105–6.

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34. Bayard.

35. *Ibid.*, 70

36. Hudec 1

37. Sykes 19

38. Bayard.

39. Peterson

Treaty because unlike the latter, the GATT has evolved. Dispute resolution in the form of GATT panels undoubtedly has played some role, but certainly not an overwhelming one. Until recently, the panels moved at a ponderous pace and could easily be frustrated, especially by large states.³⁴ Far more successful have been the rounds of multilateral negotiations that have operated over time to ensure that certain categories of disputes would reappear less often and that have extended the boundaries of the regime.

Nevertheless, enforcement also has played an important, if controversial, role in the operation and evolution of the GATT. Between 1974 and 1994, the United States imposed or publicly threatened retaliation in 50 percent of the cases that it took to the GATT. It did so independent of any GATT action and indeed even in five cases that Bayard and Elliott believe would have fallen under GATT jurisdiction.³⁵ Observers such as Robert Hudec credit increased enforcement and such "justified disobedience" of the GATT's dispute resolution process with being an important element in the process of GATT legal reform.³⁶ Others, like Alan Sykes, credit Section 301 and Super 301 unilateralism with having inspired—ironically given the claims of the managerial school—the enhanced dispute settlement procedures of the WTO.³⁷ As Bayard and Elliott conclude in their recent study, the "USTR [U.S. Trade Representative] generally wielded the section 301 crowbar deftly and constructively, employing an aggressive unilateral strategy to induce support abroad for strengthening of the multilateral trade system."³⁸

Even in the case of environmental regimes, the source of many of the managerialist examples, enforcement plays a greater role in successes than one is led to believe and its absence is conspicuous in some notable failures. For example, until very recently compliance with the weakly enforced agreements issued under eleven international fisheries commissions was highly problematic. Agreement ambiguity and social and economic changes were not a major source of these compliance problems. State capacity was more relevant since monitoring catches is costly, but scholars agree that the developed states that were often the principal violators could have coped with the monitoring issue if they believe it was in their interest to do so. The crux of the problem was the paradox of collective action: states saw little reason to pressure their fishermen to obey rules that other states were likely to flout.³⁹ The creation of the 200-mile exclusive economic zones was a dramatic improvement because it made enforcement much easier. Consequently, the role of enforcement is growing. For instance, in April 1995 a long-simmering dispute over fishing rights in the North Atlantic among Canada, the EC, and the United States was

34. Bayard and Elliott 1994, chaps. 3 and 4.

35. *Ibid.*, 70.

36. Hudec 1990, 116.

37. Sykes 1992.

38. Bayard and Elliott 1994, 350.

39. Peterson 1993, 280.

resolved by an agreement that the *New York Times* reported, "could serve as a model for preserving endangered fish stocks throughout the world." The key to the accord, says the article, is "enforcement." The deal provides for elaborate verification measures and "imposes stiff fines and other penalties for violations."⁴⁰ The elaborate verification measures testify to the importance of transparency, but to believe that they would be effective in the absence of sanctions is naive. The benefits of cheating are too great to be offset by transparency alone.

The cost of ignoring the connection between enforcement and compliance when there is a substantial incentive to defect is well-illustrated by the Mediterranean Plan, considered by many to be an example of how epistemic communities have been able to play a significant role in effecting international cooperation. The Mediterranean Plan achieved consensus by eliminating any meaningful restrictions on dumping and providing no enforcement mechanism for those minimal targets and restrictions that were agreed to. As a result, it has been an embarrassing failure. Pollution has increased, dolphin hunting continues, and despite a European Union ban on drift nets longer than 2.5 kilometers, the rules are widely flouted.⁴¹ The result has been a collapsing ecosystem in the Mediterranean.

The complementary relationship between transparency and enforcement is exemplified by a case that the managerialists believe to be an archetype of their approach. The case, described by Mitchell, involves the attempt by the International Maritime Consultative Organization (IMCO) and its successor, the International Maritime Organization (IMO), to regulate intentional oil pollution by oil tankers. From 1954 until 1978, the regime had little success and oil discharges were over three to thirty times the legal limit.⁴² In 1978 the IMO switched strategies and with the negotiation of the International Convention for the Prevention of Pollution from Ships (MARPOL) began to regulate oil pollution by requiring tankers to be equipped with segregated ballast tanks (SBT). Despite the reduced cargo capacity and increased costs of equipping new and old oil tankers with the new equipment, and "despite strong incentives not to install SBT, tanker owners have done so as required. . . . Compliance is almost perfect."⁴³

Why was the equipment regime so much more effective at inducing compliance? It is not difficult to argue that increased enforcement was anything but irrelevant. We learn for example, that "the [equipment violations regime] provided the foundation for a noncompliance response system involving far more potent sanctions than those available for discharge violations."⁴⁴ State-

40. *New York Times*, 17 April 1995, A2.

41. "Dead in the Water," *New Scientist*, 4 February 1995.

42. Mitchell 1994b, 439 in particular.

43. Mitchell 1994a, 291.

44. *Ibid.*, 289.

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45. *Ibid.*, 266

ments such as these suggest that while increased transparency was critical to the success of MARPOL, it was also critical that tankers lacking the International Oil Pollution Prevention (IOPP) certificate could be barred from doing business or detained in port.

The huge opportunity costs of having a ship barred from port or detained would force a tanker owner to think twice. . . . A single day of detention cost a tanker operator some \$20,000 in opportunity costs, far higher than typical fines being imposed. . . . Detention provisions have altered behavior because they have had the virtue of imposing . . . high costs on the violator, making their use more credible and more potent . . . detention is a large enough penalty to deter a ship from committing future violations.⁴⁵

Enforcement and the future of cooperation

The significance of the cases discussed above lies not in their representing typical cases of noncompliance but in their salience and role as counterexamples to the unqualified prescriptions of the managerial theory. They should also make us skeptical of any contention that mixed-motive game-based cooperation (with its incentive for one or both sides to defect if they can get away with it) plays only an insignificant role in regulatory regimes. If some persistently have underestimated the value of interstate coordination vis-à-vis the solution of mixed-motive games, others should not commit the opposite error of pretending that the latter—and enforcement—is irrelevant. This is especially true in light of the likely evolution of regulatory cooperation.

Cooperation in arms, trade, and environmental regulation may begin with agreements that require little enforcement, but continued progress seems likely to depend on coping with an environment where defection presents significant benefits. It is not appropriate to counter skepticism about the success of treaties that require steep cuts in nontariff barriers, arms, or air pollution but that contain no enforcement provision with statistics about the average rate of compliance with international agreements that require states to depart only slightly from what they would have done in the absence of an agreement. Techniques used to ensure compliance with an agreement covering interstate bank transfers cannot be counted on to ensure the success of the WTO's new rules governing intellectual property.

It is possible, of course, that deeper cooperation (e.g., stricter arms control or environmental regulation) can be ensured without much enforcement. This can occur whenever the underlying game changes in such a way that there is less incentive to defect from a given agreement. One of the points too rarely made by either the managerial or political economy (i.e., enforcement) school

45. *Ibid.*, 266 and 182–85.

is that changes in technology, relative prices, domestic transitions, and ideas have inspired more international cooperation and regulatory compliance than have all efforts at dispute resolution and enforcement combined. This is particularly true in the area of trade liberalization. As Kenneth Oye recently has noted, "Over the long term, the diffusion of ideas, the impact of market-driven shifts in exchange rates, and fundamental concerns over productivity and growth are more consequential sources of pressure for reducing protection."⁴⁶ Yet, while we agree that ideas and relative prices are important determinants of compliance, they are not well-specified strategies that instruct policymakers how they can increase the rate of compliance.⁴⁷ We know relatively little about how to use ideas to change preferences about discount rates, consumption versus savings, or the environment and still less about the endogenous manipulation of relative prices for policy aims such as arms control. We know much more, as crude as our knowledge may be, about the impact of enforcement coupled with managerial variables such as transparency.

If the managerialists want to hope (like most of us) that ideas or relative prices will inspire states to value the environment more or to be more energetic in controlling arms, this is understandable. It is nevertheless different from the prescriptions that they are currently emphasizing and may also prove overly optimistic. While some regimes appear over the years to have been strengthened by the changes in relative prices, the dissemination of progressive ideas about the potential of cooperation, and the weakening of parochial domestic interests, others have shown signs of weakening because of these same factors. The nonproliferation regime, for example, has shown signs of fraying because the relative cost of nuclear weaponry has declined.

We do not mean to imply that the managerial model and the failure to embrace the idea that enforcement is often necessary are the only things preventing deeper cooperation. Obviously, states have reasons to refrain from vigorous enforcement. The question is whether it is better to cope with such reluctance by declaring that its importance has been vastly exaggerated or by trying to remedy matters.

We obviously prefer the second course of action, and we believe that the managerialists' vision of cooperation and compliance distracts political scientists from a host of problems that lie squarely within their area of expertise. For example, the vast majority of political economists would argue that the reason the GATT has encountered compliance problems and the reason why states have not obtained the cooperative benefits that would be possible through the use of more aggressive enforcement strategies involves an agency problem.

46. Oye 1994, 161.

47. For discussions of the impact of ideas on cooperation and compliance, see Goldstein and Keohane 1993; P. Haas 1992; and E. Haas 1990.

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Political leaders, if not the consumers who make up their constituencies, are left better off if they acquiesce to protectionist demands during those periods (e.g., recessions, following a technological breakthrough by foreign competition) when interest groups are likely to pay a premium that is greater than the electoral punishment they are likely to receive. Because the timing of such events is uncertain and most leaders are similarly vulnerable to such events, they deal with this situation by creating penalties for violations that are high enough to prevent constant defection but low enough to allow self-interested defection when circumstances demand it. Even leaders of states that are, for whatever reason, more committed to free trade are reluctant to increase the penalty for violations to a very high level because they suspect (probably correctly) that the "protectionist premium" is at times far greater than the cost of any credible punishment for violations. Thus, their hand is stayed not by any appreciation for the accidental nature of defection but by an appreciation for just how unaccidental it is.⁴⁸

This is a dimension of political capacity that the managerial school rarely discusses and that is unlikely to be exorcized by technical assistance. It is, however, intimately connected to the design of both domestic political institutions and international regimes. One possible strategy is to restrict regime membership to states that will not have to defect very often. The idea is that whatever benefit is lost by excluding such states from the regime will be more than made up by permitting those that are included to set and also enforce a deeper level of cooperation—in this case a higher standard of free trade. This may be a reason, quite different from the large- n coordination concerns of collective action theory, why many deeply cooperative regimes have a limited number of members and why regimes with a large number of members tend to engage in only shallow cooperation. Is this trade-off real? Must states sometimes choose between aggressively addressing an environmental or trade problem and trying to create a community of states? We do not know. What we do know is that to ignore the issue on the basis of high compliance rates and the relative absence of enforcement is dangerously premature.

Appendix A

This appendix gives the assumptions of the model we use and some propositions derived from these assumptions. Proofs are omitted.

ASSUMPTION 1. *The utilities of states A and B, U_A and U_B , have two continuous partial derivatives.*

48. Downs and Rocke 1995.

ASSUMPTION 2. It is never in A's interest for B to have a greater amount of protection; that is

$$\frac{\partial U_A(P^A, P^B)}{\partial P^B} < 0, \quad \forall P^B,$$

where P is the level of protection. Similarly,

$$\frac{\partial U_B(P^A, P^B)}{\partial P^A} < 0,$$

ASSUMPTION 3. For any fixed value of P^B , $U_A(P^A, P^B)$ is strictly increasing on $[0, R_A(P^B)]$ and strictly decreasing on $[R_A(P^B), \infty)$ as a function of P^A , where the position of the maximum may depend on P^B . Declining marginal returns to protectionist measures together with linear costs are sufficient to ensure this. This implies that there is a unique best response $R_A(P^B)$ by A to any choice by B. Similarly, for any fixed value of P^A , $U_B(P^A, P^B)$ is strictly increasing on $[0, R_B(P^A)]$ and strictly decreasing on $[R_B(P^A), \infty)$ as a function of P^B .

ASSUMPTION 4. A stability condition $\exists 0 < k < 1$ such that $R'_A(P^B) \leq k$, $\forall P^B$ guarantees that there will be no trade wars with unbounded increases in tariffs. Similarly, $R'_B(P^A) \leq k$ $\forall P^A$.

ASSUMPTION 5. $R''_A(P^A) \leq 0$, $\forall P^A$ and $R''_B(P^B) \leq 0$, $\forall P^B$. These represent nonincreasing marginal returns to increases in trade protection.

ASSUMPTION 6. $R_A(0) > 0$ and $R_B(0) > 0$. If the opponent has no tariffs or nontariff barriers, then some nonzero amount of protection is the best choice.

PROPOSITION A1. In a neighborhood of the noncooperative tariff structure, any utility function satisfying assumptions 1-6 is approximately

$$U_A(P^A, P^B) = a_A(P^B - P_0^B) + b_A(P^A - P_0^A)^2 + c_A(P^A - P_0^A)(P^B - P_0^B) + d_A(P^B - P_0^B)^2, \tag{A1}$$

in which $a < 0$, $b < 0$, $c > 0$, and $|c/2b| < 1$. In this case, the reaction function for A is derived from equating the derivative to zero and is

$$R_A(P^B) = P_0^A - \frac{c_A}{2b_A}(P^B - P_0^B). \tag{A2}$$

Then this satisfies all the conditions if the following conditions hold. (Assumption 1 is satisfied automatically since U is a quadratic):

- (1) For assumption 2 to be true at the equilibrium, we need $a < 0$.
- (2) For assumption 3 to be true, we need $b < 0$.

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Appendix B

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- (3) If A is to react to an increase with an increase and to a decrease with a decrease, we need $c > 0$.
- (4) For assumption 4 to be true, we need $|c/2b| < 1$. This is a stability requirement. When this is the case, unbridled competition returns to an equilibrium level after a series of turns; if not, then any out-of-equilibrium situation would result in unbounded increases in protectionist measures.
- (5) Assumption 5 is true always since the second partials of the reaction function are zero.
- (6) For assumption 6 to be true, we need

$$P_0^A + \frac{c}{2b} P_0^B > 0 \tag{A3}$$

which is satisfied if $P_0^A > kP_0^B$ and $P_0^B > kP_0^A$, so that the equilibrium is not too far from even. Very uneven equilibria can occur with the general model, but the global quadratic model is then no longer suitable.

Appendix B

The table below gives a chronology of arms control and related treaties and agreements, including confidence- and security-building measures and measures related to transparency, nonproliferation, and defense conversion.

TABLE B1. U.S. agreements since 1945^a

Agreement	Signed	Entered into force
Antarctic Treaty	1 December 1959	23 June 1961
"Hot Line" Agreement	20 June 1963	20 June 1963
Limited Test Ban Treaty	5 August 1963	10 October 1963
Outer Space Treaty	27 January 1967	10 October 1967
Treaty of Tlatelolco	14 February 1967	22 April 1968
Protocol II to the Treaty of Tlatelolco	1 April 1968	Ratified by U.S. 8 May 1971
Nonproliferation Treaty	1 July 1968	5 March 1970
Seabed Arms Control Treaty	11 February 1971	18 May 1972
"Accident Measures" Agreement	30 September 1971	30 September 1971
"Hot Line" Modernization Agreement	30 September 1971	30 September 1971
Biological Weapons Convention	10 April 1972	26 March 1975
"Incidents at Sea" Agreement	25 May 1972	25 May 1972
SALT I Interim Agreement	26 May 1972	3 October 1972
ABM Treaty	26 May 1972	3 October 1972

TABLE B1. *continued*

<i>Agreement</i>	<i>Signed</i>	<i>Entered into force</i>
Declaration of Basic Principles of Relations Between the U.S. and the U.S.S.R.	29 May 1972	29 May 1972
Prevention of Nuclear War Agreement Between the U.S. and U.S.S.R.	23 June 1973	23 June 1973
ABM Treaty Protocol	3 July 1974	24 May 1976
Threshold Test Ban treaty	3 July 1974	11 December 1990
Helsinki Final Act	1 August 1975	1 August 1975
PNE Treaty	28 May 1976	11 December 1990
ENMOD Convention	18 May 1977	5 October 1978
Protocol I to the Treaty of Tlatelolco	26 May 1977	Ratified by U.S. 19 November 1981
SALT II Treaty	18 June 1979	— ^b
Convention on the Physical Protection of Nuclear Material	3 March 1980	
"Hot Line" Expansion Agreement	17 July 1984	17 July 1984
Stockholm Accord	Adopted 19 September 1986	Adopted 19 September 1986
Nuclear Risk Reduction Centers Agreement	15 September 1987	15 September 1987
INF Treaty	8 December 1987	1 June 1988
INF Diplomatic Note on "Weapons Delivery Vehicle"	12 May 1988	
INF Agreed Minute	12 May 1988	1 June 1988
U.S.-U.S.S.R. Ballistic Missile Launch Notification Agreement	31 May 1988	31 May 1988
"Hot Line" MOU Modification Agreement	24 June 1988	24 June 1988
INF Inspection Procedures Agreement	24 June 1988	24 June 1988
INF Special Verification Commission MOU	20 December 1988	20 December 1988
Treaty of Tlatelolco IAEA Safeguards Agreement	17 February 1989	6 April 1989
INF continuous Monitoring Inspection Procedures Agreement	9 June 1989	9 June 1989
U.S.-U.S.S.R. Major Strategic Exercises Notification Agreement	23 September 1989	23 September 1989

TABLE B1. c

<i>Agreement</i>
START Trial V Stability Mea
START ICBM Agreement
CW Verification Exchange MOU
INF Verification MOU
U.S.-U.S.S.R. C Agreement
2 Plus 4 Treaty
The Vienna Do CFE Treaty
Amendment I to INF Verificat
Amendment II the INF Veri
Amendment III INF Verificat
Amendment IV INF Verificat
START Treaty
The Vienna Do Treaty on Open
Lisbon START
Oslo Final Doc Implementat
U.S.-U.S.S.R. J standing on S sive Arms
Open Lands MOU
Korean Nuclear tion Statemen
U.S. and Russia Transportati tion of Weap
Fissile Material Agreement

TABLE B1. *continued*

<i>Entered into force</i>	<i>Agreement</i>	<i>Signed</i>	<i>Entered into force</i>
May 1972	START Trial Verification and Stability Measures Agreement	23 September 1989	23 September 1989
June 1973	START ICBM Verification Agreement	23 September 1989	23 September 1989
May 1976	CW Verification and DATA Exchange MOU	23 September 1989	23 September 1989
December 1990	INF Verification Implementation MOU	21 December 1980	21 December 1989
August 1975	U.S.-U.S.S.R. CW Destruction Agreement	1 June 1990	Not yet entered into force
December 1990	2 Plus 4 Treaty	12 September 1990	3 October 1990
October 1978	The Vienna Document 1990	Adopted 17 November 1990	1 January 1991
ratified by U.S. 19 November	CFE Treaty	19 November 1990	9 November 1992
— ^b	Amendment I to the MOA on INF Verification	4 April 1991	4 April 1991
	Amendment II to the MOA on the INF Verification	4 April 1991	4 April 1991
7 July 1984	Amendment III to the MOA on INF Verification	11 December 1991	11 December 1991
Adopted 19 September 1986	Amendment IV to the MOA on INF Verification	11 December 1991	11 December 1991
5 September 1987	START Treaty	31 July 1991	Not yet entered into force
June 1988	The Vienna Document 1992	Adopted 4 March 1992	—
	Treaty on Open Skies	24 March 1992	Not yet entered into force
1 June 1988	Lisbon START Protocol	23 May 1992	
31 May 1988	Oslo Final Document on FE Implementation	5 June 1992	5 June 1992
24 June 1988	U.S.-U.S.S.R. Joint Understanding on Strategic Offensive Arms	17 June 1992	
4 June 1988	Open Lands MOU	17 June 1992	17 June 1992
10 December 1988	Korean Nuclear Nonproliferation Statement	Dated 17 June 1992	
5 April 1989	U.S. and Russian Agreement on Transportation and Destruction of Weapons Proliferation	17 June 1992	17 June 1992
9 June 1989	Fissile Material Containers Agreement	17 June 1992	Not yet entered into force
23 September 1989			

TABLE B1. *continued*

<i>Agreement</i>	<i>Signed</i>	<i>Entered into force</i>
Armored Blankets Agreement	17 June 1992	17 June 1992
Emergency Response Equipment and Training Agreement	17 June 1992	17 June 1992
Joint Understanding Side Letter on Strategic Offensive Arms	18 June 1992	18 June 1992
FE 1A Concluding Act	10 July 1992	17 July 1992
U.S. DOD and Russian President's CAW Committee Agreement on CAW Destruction, Transport, or Storage	30 July 1992	30 July 1992
U.S. DOD and Russian MINATOM Agreement on Cargo and Guard Railcar Conversion Kits for Transportation of Nuclear Weapons and Material	28 August 1992	28 August 1992
U.S. and Russian Agreement on Disposition of HEU	Initialed 28 August 1992	Not yet entered into force
U.S. DOD and Russian MINATOM Agreement on Technical Assistance for Storage Facility Design for Fissile Material	6 October 1992	6 October 1992
U.S. and Belarussian Agreement on Emergency Response and Prevention of Proliferation of Weapons of Mass Destruction	22 October 1992	
Emergency Response Equipment and Training Agreement	22 October 1992	22 October 1992
Export Control Systems Agreement	22 October 1992	22 October 1992
Continuous Communications Link Agreement	15 January 1993	15 January 1993
START II Treaty	3 January 1993	Not yet entered into force
Chemical Weapons Convention	13 January 1993	Not yet entered into force

^aAbbreviations and acronyms are as follows: ABM = Antibalistic Missile, CFE = Conventional Forces in Europe; CW = Chemical Weapons; DOD = Department of Defense; ENMOD = Environmental Modification; HEU = Highly Enriched Uranium; IAEA = International Atomic Energy Agency; ICBM = Intercontinental Ballistic Missile; INF = Intermediate-range Nuclear Forces; MINATOM = Russian Nuclear Power Ministry; MOU = Memorandum of Understanding; PNE = Peaceful Nuclear Explosions; SALT = Strategic Arms Limitations Talks; START = Strategic Arms Reduction Talks.

^bDashes indicate missing information.

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 Defense; ENMOD =
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 Intermediate-range Nuclear
 Agreement; START =
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