

# INTERNATIONAL LAW AND INTERNATIONAL RELATIONS

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“drown out” the information about  $\varepsilon$  implicit in the parties’ first-period outcomes. In other words, as the environment becomes noisier, it is harder for states to learn.<sup>22</sup>

Up to this point, I have considered a two-period version of my model solely for simplicity in exposition and analysis. The real world, of course, has more than two periods. A more general version of my model lengthens the time horizon to infinity. The basics of the analysis stay the same, but states now may face two choices. The first is an agreement-type choice between no agreement, one infinite-duration agreement, and one finite agreement followed by an infinite-duration agreement. If states choose to renegotiate the agreement, they must then make a second choice regarding the timing of the renegotiation. The degree of noise in the environment will determine the optimal timing, with more noise leading to a longer period before renegotiation so that the parties have more time to learn about the true distribution of gains. This case of a finite-duration agreement followed by renegotiation and an indefinite-duration agreement is of particular interest because the NPT adopts this form.

#### NUCLEAR NON-PROLIFERATION TREATY

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This case study makes the following points. First, it reveals the empirical importance of this structure of duration and renegotiation provisions. The NPT is arguably one of the more important international agreements of this century. An understanding of its provisions necessarily informs any

<sup>22</sup> It is important to note that the implications of my model are consistent with certain neorealist views of international cooperation. While my model incorporates neoliberal assumptions (that is, states care about absolute gains), incorporating the neorealist assumption that states care about relative gains would actually *enlarge* the set of cases for which states would choose to incorporate renegotiation provisions into their international agreements. In fact, Grieco states that “If two states are worried or uncertain about relative achievement of gains, each will prefer a less durable cooperative arrangement, for each will want to more readily be able to exit from the arrangement in the event that gaps in gains favor the other.” Grieco 1990, 228. (I thank an anonymous referee for pointing me to this passage in Grieco’s work.) In terms of Figure 15.1, adding in concerns about relative gains would lower the expected value of a nonrenegotiated agreement and raise the value of a renegotiated agreement. These movements result from the fact that concerns about relative gains magnify the utility gains and losses associated with any given departure from the agreed-upon division of gains. The net result is that the lines in Figure 15.1 would then cross to the left of where they do in a world where states care only about absolute gains, which means that adding in concerns about relative gains *increases* the set of cases in which the states choose to renegotiate.

analysis of its successes and failures and also contributes to the effective design of future agreements.

Second, at an even more basic level, the case demonstrates the importance that the parties to major international agreements assign to duration and renegotiation provisions. They spend time debating them during the negotiation process, they implicitly (and sometimes explicitly) recognize the trade-off captured by my model, and they choose these provisions in a way that my model shows to make sense.

Third, the case study provides an example of how to operationalize the key variables in the model. The variables in the model, like many variables considered by political scientists more generally, are more difficult to operationalize than, for example, earnings are for an economist. The case pays particular attention to operationalizing the distribution of gains from the agreement and the uncertainty that initially surrounded this distribution.

Fourth, the case study demonstrates that my model provides a powerful framework for organizing and systematizing discussions of the duration and renegotiation provisions of international agreements. By identifying the key variables that determine these provisions, it guides the investigator in sifting through what is, in the case of the NPT, a very large volume of information. It also highlights key areas on which the parties disagreed and shows how the solutions they chose solved the problems they faced.

### **Background and Substance of the Agreement**

The NPT was signed in 1968 and entered into force in 1970 for a period of twenty-five years. In 1995 the parties to the treaty reconvened and decided to extend the treaty indefinitely. The NPT arose out of fears on the part of the existing nuclear-weapon states (NWS) during the early Cold War era that the spread of nuclear weapons to a substantial number of additional countries would be both dangerous and destabilizing. As Thomas Graham recounts, "In 1968, the United States Atomic Energy Commission foresaw a world that might have as many as twenty-eight nuclear powers. The danger that such a world would pose cannot be overstated." Quoting a Swiss official, he continues, "Between two nuclear powers it's a game of chess, among four, it's bridge, among a dozen, it would be poker, roulette, or any of those games controlled by chance."<sup>23</sup> In response to this concern, the United States and the Soviet Union,

<sup>23</sup> Graham 1989, 662.

along with a number of other countries, undertook to establish a treaty prohibiting the further proliferation of nuclear weapons.

The treaty has the following main provisions: Article 1 prohibits NWS from transferring nuclear explosives to any recipient regardless of whether that recipient is a party to the NPT and from otherwise assisting a nonnuclear-weapon state (NNWS) in developing such weapons. Article 2 places obligations on the NNWS not to receive or manufacture nuclear explosive devices. Article 3 requires that the signatories negotiate either individually or collectively full-scope safeguards agreements with the International Atomic Energy Association (IAEA). Articles 4 and 5 provide reassurance to the NNWS that they will be able to enjoy the peaceful uses of nuclear energy and nuclear explosions without discrimination, that is, the NWS are obliged to provide both technological and material assistance to the NNWS. Article 6 demands progress by the existing nuclear powers on controlling the arms race.<sup>24</sup>

### **Duration and Renegotiation: The Role of Uncertainty**

Choosing the duration and renegotiation provisions of the NPT provoked an intense debate. The treaty negotiations lasted from 1962 to 1968. As late as 1967, the United States and the Soviet Union (the original drafters of the treaty) were pressing for a treaty with an unlimited duration, whereas the Germans and the Italians were emphasizing the impossibility of accepting such a duration. Because of their uncertainty about the distribution of gains that would result from the NPT, many NNWS mirrored Germany and Italy in being wary about tying their hands for an unlimited period in an uncertain world.

First, uncertainties surrounded the security consequences of the treaty. The NNWS felt great uncertainty about the effort that the NWS would put into nuclear disarmament.<sup>25</sup> Closely related to this is a paradox inherent in the text of the NPT. If the NWS really did reduce their nuclear stockpiles as Article 6 commits them to do, the extended deterrence they provide to their NNWS allies would become less credible,

<sup>24</sup> Treaty on the Non-Proliferation of Nuclear Weapons 1968.

<sup>25</sup> A broader formal model of duration and renegotiation choice in the NPT could include NWS effort as an unobserved variable and actual arms reductions as an observed variable increasing in effort but not completely determined by it. The NNWS, which might condition their willingness to extend the treaty on observed disarmament, would then essentially be in a principal-agent relationship with the NWS.

and these states would have a stronger incentive to join the nuclear club.<sup>26</sup> In regard to the nonnuclear NATO countries, George Bunn and Charles N. Van Doren note that the “countries that were most advanced in civilian nuclear technology and that relied on an alliance with the United States to deter possible attack by the Soviet Union spoke out . . . against an NPT of longer duration than their alliances might turn out to be.”<sup>27</sup> Jenson content-analyzed speeches made during a 1968 UN General Assembly debate on the proposed treaty in an effort to ascertain and categorize reservations. He reports that 62 percent of the speakers expressed concern regarding security guarantees, wondering how NNWS would be protected under the NPT.<sup>28</sup>

Another source of uncertainty about the distribution (and level) of security benefits under the NPT centered on which countries would end up participating in the regime. The overall level of gains increases with the number of countries that join, and the distribution of gains depends heavily on the geographic distribution of signators.

Second, the NNWS were concerned about the effect of the NPT on their economic prosperity and on their technological development. They were apprehensive that the treaty might restrict their ability to make peaceful use of nuclear energy. The treaty would have to draw a line between the use of nuclear energy for peaceful, civilian purposes and the use of nuclear energy for military purposes. Much uncertainty existed among the NNWS about whether this line could be effectively drawn and what the distributional effects would be of drawing it. Speaking before the Bundestag in 1967, Foreign Minister Brandt declared that his “government and others are also seeking to insure that the nonproliferation treaty does not further widen the already existing technological gap between the nuclear powers and the non-nuclear countries.”<sup>29</sup>

Many potential NPT members also worried about how economically costly the IAEA monitoring would turn out to be. George Quester details concerns raised by the Japanese nuclear power industry about the potential costs associated with the extensive on-site monitoring required by the NPT, including the possibility of shutting down plants in order to

<sup>26</sup> See, for example, the discussion in Smith 1987.

<sup>27</sup> Bunn and Van Doren 1992, 5. These NNWS did not propose making the NPT duration contingent on the continued membership of the United States in NATO. This suggests that the barriers to contingency in agreements that are often invoked in theory are also present in fact.

<sup>28</sup> Jenson 1974, 2.

<sup>29</sup> U.S. Arms Control and Disarmament Agency 1967, 49.

allow verification of nuclear fuel information. Quester also notes that many states (including Japan) worried that “the IAEA inspectorate may become imperiously bureaucratic, demanding greater access even where no increase whatsoever is thereby achieved in safeguards reliability . . . due to personal vanity, institutional imperialism, or excessive legalism.”<sup>30</sup> These concerns affect both the distribution and level of gains given concerns that the IAEA would be dominated by those NWS whose experts performed the inspections; those states could vary the inspection costs to suit their political and economic agenda.

Another area of uncertainty about the distribution of economic gains concerned the NPT’s failure to fully address the relationship between parties to the NPT who supply nuclear technology and NNWS not party to the treaty who purchase it. The NNWS that joined the treaty worried that NNWS not party to the treaty would be able to obtain nuclear technology with fewer restrictions than signatory NNWS.

The potential decline of the U.S. commercial nuclear industry added still another source of uncertainty. As Roger K. Smith notes, this decline was expected, but it would have been difficult to know in advance when other suppliers would emerge and who they would be.<sup>31</sup> These changes would affect states on both sides of the market for peaceful nuclear technology.

Third, uncertainties surrounded the political benefits and costs that would result from such an agreement. Because the NPT would make the NNWS importers of peaceful nuclear technology, they were uncertain about whether this situation would give the NWS political leverage they could exploit. A similar concern was expressed about fuel supplies. Moreover, the effect of treaty adherence on the political power and prestige of the NNWS was uncertain. Prestige might follow from the acquisition of nuclear weapons or it might follow instead from a state’s willingness to accede to the treaty. As Lloyd Jensen states: “If there is general acceptance of the NPT, the few states refusing to join are likely to be just that much more criticized.” Only time would tell how universal the treaty (and the norm embodied in it) would become.<sup>32</sup>

Other political concerns revolved around specific regional issues. According to Quester, Italy worried that European unification would “be impossible once the NPT has endorsed France and Britain as nuclear states

<sup>30</sup> Quester 1973, 105, 212.

<sup>31</sup> Smith 1987.

<sup>32</sup> Jensen 1974, 38.

and relegated Germany and Italy permanently to the position of non-weapons status.”<sup>33</sup> That is, Italy worried that the distribution of gains from the NPT would skew the distribution of power in Europe in ways that would make European integration difficult if not impossible. On the other side of the globe, Japan had concerns over how the NPT would affect its ability to react to a broader U.S. withdrawal from Southeast Asia in the wake of the Vietnam War.

In sum, the parties to the NPT faced substantial uncertainty at the time of its inception about its effects on their security and on their economic and political well being. Some of this uncertainty, such as that surrounding how many countries would eventually join the regime, concerned the overall level of gains from the agreement. However, much of the political and security uncertainty, and all of the economic uncertainty, concerned the distribution of gains (and possibly losses) from the NPT. For example, conditional on any given number of countries joining the regime, which specific countries joined had large effects on the distribution of security gains from the agreement. In the economic realm, concerns about how well peaceful uses of nuclear power could be separated from military ones, competition in the market for peaceful nuclear power technology, and IAEA inspection costs are all distribution.

This kind of uncertainty is the cornerstone of hypothesis 1. In this case, the agreement shock,  $\varepsilon$ , can be broken down into three components: security, economic, and political. All three are characterized by high variance.<sup>34</sup>

Additionally, it is important to note that many aspects of the uncertainty about the distribution of gains from the NPT were of the one-time character that underlies my model. For example, to the extent that the advent of the NPT set in motion a transition to a stable equilibrium in terms of membership in the regime, all that states have to do is to wait and find out what that equilibrium will be to determine the realized distribution of gains. Similarly, once a stable set of institutions arises to govern the transfer of peaceful nuclear technology by members to nonmember NNWS, the

<sup>33</sup> Quester 1973, 7.

<sup>34</sup> Hypothesis 1 is essentially a comparative static result, which cannot be tested with this case study. The case study does, however, show the plausibility of the model. Later, I briefly compare the NPT to the Outer Space Treaty for which the variance of the agreement shock was arguably low. Additionally, hypothesis 1 is put forth as a conjecture in the Rational Designs project (Koremenos, Lipson, and Snidal [2001]) and is the most strongly supported conjecture among the eight case studies.

member NNWS can determine the effect of this aspect of the NPT on their economic well being.

### **Duration and Renegotiation: The Compromise**

The Italian representative to the negotiating committee, Roberto Caracciolo, proposed a "certain flexibility in the provisions of the treaty relating to duration, amendments, and the right of withdrawal"; reacting to Article 7 of the draft treaty, which called for a treaty of unlimited duration, he stated that, "it is not the lot of man, to pledge eternity. Moreover, if we look back across our thousands of years of history, we see very few noninstitutional treaties that have simply survived the vicissitudes of one generation, let alone achieved immortality. Therefore we fear that to affirm a principle so remote from reality may introduce into the treaty an element of weakness rather than of strength."<sup>35</sup> Reacting to this same article, a Swiss aide-memoire stated that "to subscribe to such a commitment seems hardly conceivable in a field where development is as rapid and unpredictable as that of nuclear science and its technical, economic, political, and military implications." Consequently, it would be preferable that the treaty should be concluded for a definite period, at the end of which a review conference would decide about its renewal.<sup>36</sup>

The states that favored an unlimited duration argued that if the parties knew for certain that the treaty would end on a specified date in the future, they would feel pressure to obtain nuclear weapons by that date, thereby undermining the treaty. Furthermore, they argued that it was important that the treaty be guaranteed a life-span of sufficient length to enable it to serve as a foundation upon which other nuclear disarmament measures could be built.

The parties began the path toward compromise when Caracciolo submitted the following to replace the "unlimited duration" paragraph in the draft treaty: "This treaty shall have a duration of X years and shall be renewed automatically for any party which shall not have given, six months before the date of expiry of the treaty, notice of its intention to cease to be party to the treaty." He stated that "the proposed amendment could be regarded as an acceptable compromise between the idea of unlimited duration and that of a fixed term. It provides that the treaty

<sup>35</sup> U.S. Arms Control and Disarmament Agency 1967, 527-29.

<sup>36</sup> *Ibid.*, 573.



shall always remain in force for those who do not denounce it, and at the same time allows those who are not satisfied with its operation to withdraw after a certain number of years.”<sup>37</sup> A month later the Italian amendment was revised: “The present treaty shall have a duration of X years. It shall be automatically extended for terms equal to its initial duration for those governments which, subject to six months notice, shall not have made known their intention to withdraw.”<sup>38</sup>

The final resolution of the duration and renegotiation issues was a compromise between the Soviet and U.S. desires for an indefinite-duration agreement and the preferences of the NNWS for a finite learning period during which they could determine whether the agreement as it worked in practice was in their interest. As Bunn and Van Doren explain, “The Italian proposal for a specific period, plus successive automatic renewals, was the most detailed and the most important before the American and Soviet co-chairmen when they drafted the present language of Article 10.2.” They continue: “What the Co-Chairmen drafted – the present Article 10.2 – called for an extension conference after 25 years to decide whether to extend the Treaty ‘indefinitely . . . or for an additional fixed period or periods.’ It thus accepted the basic Italian idea of a first period of years at the end of which there would be an opportunity for renewal. To the Italian option for an indefinite number of consecutive renewal periods, the drafters added other options, including indefinite renewal and one fixed period.”<sup>39</sup>

The drafters also altered the renewal mechanism proposed by the Italians. Instead of individual notices of intentions to withdraw (and therefore automatic subsequent withdrawal), the duration issue would be decided at a multilateral extension conference after twenty-five years.

Why did the NWS and NNWS have different preferences over duration? This can easily be explained within the context of my model. It is reasonable to assume that the distribution of possible values of the agreement shock  $\varepsilon$  was skewed. Specifically, there was virtually no chance that the NWS could “lose big” from the NPT. The worst that could happen for them would be to find out that nuclear weapons had no use and hence were a complete waste of resources. In contrast there was a chance that the NNWS could “lose big” from adhering to an agreement that demanded they forsake nuclear weapons in a world in which other

<sup>37</sup> *Ibid.*, 529.

<sup>38</sup> Bunn and Van Doren 1991, 7.

<sup>39</sup> *Ibid.*, 7–8.

states – both members and nonmembers of the NPT – possessed them. Such a skewed distribution would imply different preferences over duration even if the expected gains of the NWS and NNWS were equal.<sup>40</sup>

### Resolving the Uncertainty Through Learning

The sources of economic, political, and security outcomes are ambiguous. For example, if a state experiences a low growth rate in a given year, the role played by its decision not to develop its own nuclear industry may not be immediately apparent. The costs and benefits of nuclear energy as a source of power were quite uncertain in the late 1960s and early 1970s. Hence it would take time for states to sort out the effects of the NPT on their well being from those of other factors. Put another way, the level of noise (the cornerstone of hypothesis 2) is high.

If my model is relevant to this case, we should see evidence that the states involved did indeed initiate learning processes to help them distinguish the value of the agreement shock from the noise in the environment. Again, the real world is seldom two periods, and the NPT context is no exception. The multiperiod variant of hypothesis 2 addresses both the incidence and the timing of renegotiation.<sup>41</sup>

The parties to the NPT planned review conferences every five years at which they could cooperatively take stock of how the treaty was working in practice. This interval was chosen in part because it would take approximately that long to produce arms control agreements. Referring to the Third Review Conference, Hon. Lewis A. Dunn, of the U.S. Arms Control and Disarmament Agency, stated:

The main task at the Review Conference will be an article-by-article review of the operation of the Treaty. Woven throughout that review and ensuing debate there will be five major questions. First, has the Treaty strengthened the security of the parties by helping prevent the further spread of nuclear explosives? Second, how well has the Treaty facilitated cooperation in the peaceful uses of nuclear energy? Third, what has been done to bring the nuclear arms race to an end? Fourth, what can realistically be done to strengthen the NPT? And most important of all, weighing each of these considerations, has the NPT been a success?<sup>42</sup>

<sup>40</sup> For simplicity, the formal model and the simulations presented in the second section assume the agreement shock,  $\varepsilon$ , has a symmetric distribution. Importantly, there is nothing in the model that precludes the agreement shock from having a skewed distribution.

<sup>41</sup> Koremenos 1999.

<sup>42</sup> U.S. House of Representatives 1985, 65.

The evidence indicates that the uncertainty about many aspects of the true distribution of gains persisted years after the NPT was signed. At the 1980 Review Conference, the debate centered on Article 4 (which focuses on technological exchange) and Article 6 (which focuses on arms control). Disagreements between the NWS and the NNWS regarding how these Articles were working in practice prevented the conference participants from agreeing on and hence issuing a final document. In other words, given the level of noise, the parties had not yet been able to determine the true distributional effects of the NPT. By 1985, much more of the uncertainty surrounding Article 4 had been resolved, as the following statement by Dunn illustrates:

Since the 1980 Review Conference:

- all new or amended agreements for cooperation with non-nuclear weapon states entered into by the United States have been with parties to the NPT or the Treaty of Tlatelolco;<sup>43</sup>
- virtually all US exports of enriched uranium . . . were to NPT parties; . . .
- all of US-funded IAEA “Footnote A” (extrabudgetary) technical assistance projects – 111 projects for more than \$4.5 million – have been for developing country Non-Proliferation Treaty parties.<sup>44</sup>

Essentially, the passage of time resolved much of the uncertainty over the distribution of economic gains from the NPT. Regarding the issue that raised so many concerns during the original negotiations, the parties successfully separated the civilian and military uses of nuclear technology so that trade in legitimate nuclear materials flourished under the NPT within a network of IAEA safeguards agreements. In practice, there has not been discrimination against the NNWS regarding technological progress in nuclear energy. With respect to Article 5, which addresses the issue of peaceful nuclear explosions, by the mid-1970s, it was determined by the NWS that the anticipated benefits from such explosions were not forthcoming.

Furthermore, over the two-and-a-half decades following the signing of the NPT, the parties witnessed the development of alternative suppliers of nuclear technology, such as France and Germany. Taken together, these developments represented the stabilization of the regime regarding

<sup>43</sup> The Treaty of Tlatelolco establishes Latin America as a nuclear weapons-free zone.

<sup>44</sup> U.S. House of Representatives 1985, 69–70.

the distribution of peaceful nuclear technology to NNWS. Under the regime that eventually emerged, it was clear that the NNWS that joined the NPT would not suffer economic harm along this dimension.<sup>45</sup>

In addition to the concerns that played a major role at the review conferences, many other aspects of the uncertainty surrounding the distribution of gains from the NPT were largely or completely resolved during the initial trial period: In terms of security, the NPT greatly reduced the spread of nuclear weapons compared with what would likely have occurred without it. During the trial period, membership in the NPT increased to the point of being almost global.

In terms of the distribution of political gains (and losses), it became clear that concerns that the NPT would prevent European integration were groundless. What turned out to matter for European integration was not Britain's bombs but Germany's GNP. Time also rendered moot Japan's worries about its ability to react to a broad U.S. pullout from Asia.

In 1995 after four review conferences, the 163 parties to the treaty gathered in New York to decide whether the NPT would continue in force indefinitely or be extended for an additional fixed period or periods. Interviews with conference participants suggest that essentially all of the parties came to the conference favoring extension, a fact that itself provides powerful evidence of learning. Debate centered on whether extension would be indefinite or for a series of twenty-five-year periods.<sup>46</sup> In the end, a consensus resolution extended the NPT indefinitely. The NWS had gained what they expected to in terms of maintaining their power and influence (as Panofsky and Bunn note, "possession of nuclear weapons and permanent membership in the UN Security council remain identical"),<sup>47</sup> and the NNWS had learned how the NPT worked for them in practice.

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<sup>45</sup> Nye presents additional examples of learning and uncertainty resolution in his discussion of policies relating to the nuclear fuel cycle and attempts to control aspects of the cycle related to nuclear weapons development. Nye 1981.

<sup>46</sup> The interviews appear in Welsh 1995. The debate regarding the extension provision was largely among the NNWS, since the NWS all favored indefinite extension. Ultimately, the Canadian argument that indefinite duration would cause the NWS "to be permanently held accountable to Article VI on disarmament" carried the day.

<sup>47</sup> Panofsky and Bunn 1994, 9.