

1 *Introduction*

On March 5, 2020, the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) celebrated fifty years since its entry into force. To mark the occasion, the foreign ministers of the five nuclear weapons states recognized by the treaty – the United States, Russia, the United Kingdom, France, and China – momentarily put aside various geopolitical disputes to issue a joint statement and “celebrate the immeasurable contributions this landmark treaty has made to the security and prosperity of the nations and peoples of the world.” The nuclear states expressed their view that “[t]he NPT has provided the essential foundation for international efforts to stem the looming threat – then and now – that nuclear weapons would proliferate across the globe.”¹ Other accolades rolled in from governments, international organizations, policy analysts, and academics, mostly lauding the treaty’s success.²

This outpouring of support for the NPT is notable for its acknowledgment of the treaty’s role in limiting the spread of nuclear weapons. The outlook for nuclear proliferation in the 1950s and 1960s, before the NPT was conceived, was fairly pessimistic. The policymakers, analysts, and scholars of the time predicted that many new states would acquire nuclear weapons, absent an arms control breakthrough. President Kennedy famously said in 1963 that he was “haunted by the feeling that by 1970, unless we are successful, there may be 10 nuclear powers instead of four, and by 1975, 15 or 20 . . . I see the possibility in the 1970s of the President of the United States having to face a world in which 15 or 20 or 25 nations may have these weapons.”³ The US intelligence community, for its part, assessed in 1957 that “up to 10

¹ U.S. Department of State 2020.

² See, for example, Brookings Institution 2020; Dujarric 2020; Global Affairs Canada 2020; North Atlantic Treaty Organization 2020. There were also, of course, some dissenters (Nayar 2020).

³ Kennedy 1963.

countries” could produce at least a few weapons over the next decade.⁴ One panel of nongovernmental experts, representative of several such studies, concluded in 1958 that “[b]y 1970, most nations with appreciable military strength will have in their arsenals nuclear weapons – strategic, tactical, or both.”⁵ But despite these dire predictions, only a handful of countries have developed nuclear weapons since the NPT came into force in 1970, and all of those countries have done so outside the treaty.

The NPT appears successful in other ways. It is among the most widely ratified international agreements, with 191 members. A large majority of member states have allowed for intrusive international inspections of their civilian nuclear facilities, shrugging off initial worries about cost, espionage, and competitive disadvantage. Only one state has chosen to withdraw from the treaty in its history. The few suspected violations of the NPT, at least since the end of the Cold War, have been met with strong responses by the international community, including economic sanctions and even military action. The NPT serves as the cornerstone of the nuclear nonproliferation regime, which has steadily expanded its scope to encompass dozens of treaties, agreements, and informal groups affecting nonproliferation, nuclear supply, nuclear security, and disarmament.

The success of the NPT, and the wider nuclear nonproliferation regime, is surprising. Analysts and policymakers at the time of the treaty’s signing, and even some of those involved in the NPT negotiations, had significant doubts about its likely effectiveness.⁶ The NPT lacks most of the characteristics we expect to see in successful international institutions, such as enforcement or adjudication mechanisms. Information sharing within the regime is fraught, and treaty loopholes abound. States can simply choose to withdraw from the treaty with no prescribed repercussions. Yet the agreements within the regime are not lacking in ambition. They require members to bear significant costs, both in implementing monitoring and verification mechanisms and forgoing a significant military capability. And all of this occurs in the

⁴ Nuclear Weapons Production in Fourth Countries: Likelihood and Consequences, National Intelligence Estimate (NIE) 100-6-57, June 18, 1957, Central Intelligence Agency (CIA) FOIA Reading Room.

⁵ National Planning Association 1958.

⁶ Myrdal 1976; Quester 1967; After NPT, What?, May 28, 1968, National Security Archive (NSA): Electronic Briefing Book (EBB) 253, doc. 27.

realm of international security, where institutions are generally seen by scholars as limited in their ability to constrain state behavior.

In the chapters to come, I explain this puzzle of the nuclear non-proliferation regime: why the regime has succeeded where many, from policymakers to academic theorists, expected it to fail. I make two related arguments. First, that countries look to the behavior of others within the regime to resolve uncertainty about its effectiveness. Countries act on this information to decide whether to themselves join or abstain, to comply or violate. Second, that the extent to which countries have embraced the regime says something about their preferences in the international system. These revealed preferences affect others' decisions about whether to punish violations of the regime's tenets. Putting these two arguments together helps explain the patterns of membership, compliance, and enforcement we have seen over the regime's fifty years.

In this introductory chapter, I first describe the major components of the nuclear nonproliferation regime. I then summarize my argument, explain my contribution to the literature, and discuss the methods and scope of the book. I conclude with a roadmap of the chapters to follow.

Defining the Regime

The nuclear nonproliferation regime is the set of treaties, agreements, conventions, formal and informal groupings, rules, and norms that seek to limit the spread of nuclear weapons.⁷ The cornerstone of the regime is the NPT, which opened for signature in 1968, entered into force in 1970, and was extended indefinitely in 1995. The result of a delicate compromise between the United States, the Soviet Union, and influential nonnuclear weapons states, the NPT is sometimes seen as resting on three pillars: nonproliferation, disarmament, and the peaceful uses of nuclear technology.⁸

⁷ On regimes generally, see Krasner 1982. On security regimes, see Jervis 1982. On the multidimensional nature of the nuclear nonproliferation regime, see Fields and Enia 2009. I discuss the nuclear nonproliferation regime as a full regime complex in Chapter 5.

⁸ On the negotiating history of the regime, see the contributions to Popp, Horowitz, and Wenger 2016. This "three-pillars" origin story for the NPT is disputed, especially by some US officials, who argue that the treaty is primarily about nonproliferation and only secondarily concerned with disarmament and nuclear supply. See Ford 2009a; Ford 2009b; Rust 2017.

On nonproliferation, the treaty commits all nonnuclear weapons state members to forgo nuclear weapons pursuit or acquisition. The NPT creates a different category for the five countries recognized as having nuclear weapons at the time the treaty was negotiated. The treaty obligates these countries – the United States, Soviet Union, the United Kingdom, France, and China – not to transfer nuclear weapons to non-weapons states. Nonweapons states are also required by the NPT to reach a safeguards agreement with the International Atomic Energy Agency (IAEA), the international organization tasked with verification and monitoring within the regime. Before the NPT, countries had placed some nuclear facilities under IAEA safeguards as part of nuclear supply agreements, but the NPT went further, requiring verification measures that covered all sensitive nuclear facilities within a member state.

Article VI of the NPT calls for all parties to “pursue negotiations in good faith” on nuclear disarmament. This echoes language in the preamble of the treaty declaring the intention of state parties to end the nuclear arms race and “undertake effective measures in the direction of nuclear disarmament.”⁹ Many nonnuclear weapons states saw these provisions as a kind of compensation by the weapons states, and particularly the United States and Soviet Union, for their agreement to forgo nuclear weapons under the treaty.

The NPT also endeavors to protect the right of nonweapons states to pursue nuclear technology for peaceful purposes, calling on all parties to facilitate the sharing of nuclear technology and expertise for civilian energy applications. Because nuclear technology is fundamentally dual use – the same technology used to support a civilian nuclear power program can be used for nuclear weapons development – many non-weapons states worried that the treaty would place limits on their nuclear energy aspirations. This pillar of the treaty was meant to reassure nonweapons states that the NPT would not be used as an excuse to cut off civilian nuclear trade.

While the NPT is undoubtedly its central element, the nuclear non-proliferation regime is more than just the NPT. The regime has grown over the years to encompass other treaties, agreements, institutions, and groups associated with nuclear nonproliferation, nuclear supply, nuclear security, and nuclear disarmament. Perhaps the most

⁹ United Nations Office of Disarmament Affairs 1968b.

important international institution within the regime, besides the NPT itself, is the IAEA.¹⁰ Formed in 1957 in response to the United States' Atoms for Peace initiative, which worked to share nuclear technology globally, the IAEA's role expanded significantly after the NPT entered into force. NPT members must sign a comprehensive safeguards agreement with the IAEA to govern reporting and inspection procedures and, since 1997, states have also been encouraged to sign an Additional Protocol (AP) to that agreement, which requires greater transparency about nuclear efforts and allows for broader and more intrusive IAEA inspections.¹¹ In addition to its responsibility for nuclear safeguards, the IAEA administers the Technical Cooperation (TC) program, a sizable multilateral aid effort to share nuclear technology with less developed states.¹²

Five nuclear-weapons-free zones (NWFZs) play an important role within the wider regime. The first came into force in 1969 with the Treaty of Tlatelolco, which aims to prevent the production, acquisition, or deployment of nuclear weapons in Latin America and the Caribbean. Later treaties covered the South Pacific, Southeast Asia, Central Asia, and Africa.¹³ A prospective NWFZ in the Middle East is the subject of continued diplomatic wrangling in the context of the nonproliferation regime.¹⁴ These regional agreements have been seen as an alternative mechanism by which states can work toward the goals of nonproliferation and disarmament, while putting additional pressure on the nuclear weapons states by limiting their ability to deploy nuclear weapons in these regions.

India's 1974 nuclear test pushed nuclear supplier states to work together to control the trade in sensitive nuclear technology. The London Club of nuclear supplier countries began meeting in 1975 to coordinate export controls, and later expanded to form the Nuclear Suppliers Group (NSG). Now numbering forty-eight states, the NSG has been the locus of recent efforts both to place new requirements on

¹⁰ On the IAEA, see Brown 2015; Fischer 1997.

¹¹ On the Additional Protocol, see Hirsch 2004.

¹² Barretto and Cetto 2005; Brown and Kaplow 2014.

¹³ Some analysts consider the Antarctic, Outer Space, and Seabed treaties, each of which prohibit placing nuclear weapons in their respective area, to be NWFZs. For a general overview of NWFZs, see Goldblat 1997; Kutchesfahani 2019. The United Nations has recognized Mongolia as a single-country NWFZ (Jargalsaikhan 2005).

¹⁴ Lewis 2013.

nuclear trade, by designating the Additional Protocol as a condition of nuclear supply, and also to expand nuclear supply in ways that some see as weakening the regime.¹⁵

In response to the September 11, 2001 terrorist attacks and new revelations of black-market nuclear trade in the early 2000s, the regime has expanded its substantive reach into nuclear security, with a series of more informal groupings. The Proliferation Security Initiative (PSI), formed by the United States in 2003, is a voluntary organization to coordinate efforts to prevent or intercept trade related to weapons of mass destruction (WMD).¹⁶ The US has also led periodic Nuclear Security Summits focused on securing nuclear material, and the G-8 countries in 2002 formed the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction.¹⁷ The United Nations Security Council in 2004 adopted Resolution 1540 (UNSCR 1540), prohibiting support to nonstate actors seeking WMD and requiring domestic controls over sensitive materials.¹⁸ These initiatives have broadened the scope of the regime from restrictions on state-to-state nuclear trade to efforts to limit the spread of nuclear weapons to nonstate actors.

The Treaty on the Prohibition of Nuclear Weapons (TPNW, also known as the Nuclear Ban Treaty) opened for signature in 2017 and entered into force in 2021. The TPNW moves past earlier and long-stalled nuclear disarmament efforts within the broader nonproliferation regime, including the Comprehensive Test Ban Treaty (CTBT) and the Fissile Material Cut-off Treaty (FMCT), and calls for a blanket prohibition on developing, producing, or possessing nuclear weapons.¹⁹ While the treaty has entered into force and has over eighty signatories, no nuclear weapons states have joined, nor have most of their allies.²⁰

¹⁵ Hibbs 2011; Hibbs 2017.

¹⁶ On the PSI, see Byers 2004.

¹⁷ On Nuclear Security Summits, see Davenport and Parker 2019. On the G-8 Global Partnership, see Chuen 2005.

¹⁸ On UNSCR 1540, see Early, Nance, and Cottrell 2017 and the contributions to Bosch and van Ham 2007.

¹⁹ On the TPNW, see Gibbons 2018.

²⁰ I discuss potential tensions between the Ban Treaty and the NPT in Chapter 2.

Which Nonproliferation Regime?

Studies of the nuclear nonproliferation regime must grapple with the fact that the regime has many layers, and different states will see the same agreement as designed to achieve different goals. This is true even within the NPT; some states focus on the treaty's provisions on nuclear disarmament, others on peaceful uses of nuclear technology, and still others on nuclear nonproliferation. Other aspects of the regime address nuclear supply, nuclear testing, foreign deployment of nuclear weapons, legal liability in nuclear matters, and the risk of nuclear terrorism. If for no other reason than analytic coherence, it seems advisable to focus on a particular dimension of the regime.

In this book, then, I emphasize the nonproliferation mechanisms within the regime – that is, the role of the regime in limiting the spread of nuclear weapons to states that do not currently have them.²¹ This aspect of the regime strikes me as its common denominator, the goal that unifies nearly all of the institutions, agreements, and conventions that can be said to exist within the regime. I thus see state decisions to join the regime as influenced by restrictions on others' pursuit of nuclear weapons, judge the track record of the regime in terms of the number of nonnuclear states seeking weapons, examine punishment of states violating the regime by hosting nuclear weapons programs, and see the spread of nuclear technology in terms of its contribution to the future development of weapons.

A focus on nonproliferation also seems to best capture the underlying behavior of countries within the regime that I seek to explain in this book. The theories presented here rely on a form of reciprocity in which a country is willing to put aside nuclear aspirations as long as it has confidence that others will also give up nuclear pursuit. This reciprocal logic connects to the nonproliferation aspects of the regime more than it does to the peaceful uses of nuclear technology or nuclear disarmament.

This is not to say, however, that these other factors do not matter to state decision-making within the regime, and I will spend some time discussing them in this book. Countries such as Australia, Egypt, and Japan, for example, clearly saw access to nuclear technology as an

²¹ Mallard (2014) takes a similar approach.

important reason to join the NPT.²² Concerns about nuclear disarmament have long been central to the discourse around NPT membership and compliance, and may well play an important role in whether states decide to join the treaty and other agreements within the regime.²³ My argument is merely that for many countries acting within the majority of agreements that make up the regime, nonproliferation concerns are one important driver of state behavior, warranting in-depth consideration in the following pages.

Resolving Uncertainty within the Regime

Imagine, for a moment, a world in which state leaders are blessed with an oddly specific type of foresight: They can see the future of the nonproliferation regime. What if leaders knew, before signing on, that the regime was destined to crumble in the future amidst a flood of abandoned NPT commitments? Or if instead they could see that the regime would shrug off the occasional threat and help the international community hold the line on nuclear proliferation? These leaders would no doubt act on their premonitions. They would decline to join a regime that was bound to fail and might decide to violate the NPT or to withdraw from it if they had already joined. With advance knowledge of a happy outcome, on the other hand, these leaders could more easily set aside their own security concerns to join or comply with the NPT, aware that others would remain true to their treaty commitments. They would adopt new verification measures or punish violators of the regime in cases where they knew it was necessary to limit proliferation, but they would avoid bearing the costs of these measures if they were ineffective.

In the real world, of course, decision-making within the nonproliferation regime is clouded by uncertainty. States do not know how effective an international agreement will be in deterring cheaters or punishing violators. In this book, I argue that the compliance or membership of other states provides an important signal about the

²² On the role of nuclear supply in driving broader regime membership, see Gibbons 2020. I discuss the cases of Australia and Japan in more detail in Chapters 3 and 4, respectively.

²³ For a discussion of nuclear disarmament from a global perspective, see the contributions in Sagan 2010b. On the (disputed) link between nuclear disarmament and nonproliferation, see Ford 2007; Knopf 2012; Kroenig 2016.

distribution of state types in the population of member states, the underlying preferences of particular members, and the present and future efficacy of the regime. The information provided by the behavior of others ultimately drives state decisions to join the regime or abstain, to comply with the regime or cheat. At the same time, states send signals about their own preferences when they join or decline to join different aspects of the regime. A country's embeddedness within the regime in part determines whether its own transgressions are punished by the international community or largely overlooked. These mechanisms explain the success of the nuclear nonproliferation regime.

States are first forced to confront their uncertainty about regime effectiveness when making the decision to join. The NPT requires nonweapons states to forgo development of nuclear weapons, so potential members, at least those that intend to comply, are understandably reluctant to take on this commitment without assurances that others also will refrain from weapons work. States can find this assurance in the aggregate behavior of other countries: Have important countries decided to join the treaty? Have they adopted verification measures? Do they seem to be complying? Have cheaters been punished for their transgressions? If the behavior of others suggests a strong regime – verification measures seem strong, noncompliance rare, enforcement swift, and membership high – these potential members will assess that the regime is effective and will be more likely to join. If, on the other hand, few states have joined the treaty or adopted verification measures, cheating appears rampant, and enforcement is rarely attempted, prospective members will be more likely to abstain from the treaty, fearing their nuclear restraint would not be reciprocated.

For the smaller group of states who would join the NPT with the intent to cheat, seeking nuclear weapons covertly, the calculation is reversed. These states would prefer a weaker regime that reduces the cost of noncompliance, and these states, too, look to the behavior of the wider populations of members to resolve their uncertainty about the efficacy of the regime. If they see signs of a weak treaty – in terms of monitoring and verification, compliance, membership, and enforcement – they will be more likely to join, reassured that their violations are likely to go undiscovered or unpunished. Evidence of a more effective NPT, on the other hand, will make these states more likely

to abstain; it may be preferable to remain outside a strong treaty rather than to join and be caught cheating.

A similar calculus plays out among states once they have joined the NPT. The decision of a country to comply with the nuclear nonproliferation regime may hinge on whether it expects a substantial number of other states to comply as well. The track record of the regime provides states with a valuable signal about the behavior of others and about the future performance of the regime. When many parties have recently violated the NPT – when the track record of the regime is poor – a state will revise downward its expectations for the future performance of the regime and will thus be more likely itself to violate its commitments. This mechanism turns the track record of the regime into a kind of proliferation trigger, potentially pushing states that had been on the verge of seeking weapons to proceed with the last stages of nuclear development.

This track record mechanism of compliance is moderated by the design features of the NPT. When monitoring and verification measures are weak, member states have trouble distinguishing between an effective treaty, in which violations are rare, and an ineffective treaty in which violations are widespread but largely hidden. The track record of the regime, in that case, provides little information upon which to base one's own compliance decision, and so has little effect. When verification and monitoring measures are strong, however, the treaty's track record carries a stronger signal to member states about the future performance of the NPT, and so states will be more likely to adjust their compliance behavior in response.

While the NPT has no enforcement mechanisms built into the treaty, states frequently act both alone and in concert to punish suspected violators. Enforcement within the regime occurs selectively, however; some violators are punished, and others are not. To explain selective enforcement, I shift the focus from the broader population of member nations to an individual state's decisions about membership within the regime. The constellation of agreements that a state chooses to join helps reveal that state's underlying policy preferences around nonproliferation, and these preferences may reassure those considering enforcement actions. Ultimately, states that are more deeply embedded within the regime are less likely to be punished for their violations.

The level of embeddedness within the regime may also play an important role in determining what benefits states draw from their

Table 1.1. *Key variables explored in this book*

Aspect of the regime	Outcome variable	Explanatory variables
Membership	State-level membership in the NPT	Regime-level membership Regime-level verification Regime-level compliance Regime-level enforcement
Compliance	State-level nuclear weapons pursuit	Regime-level track record of compliance
Enforcement	State-level sanctions	State-level embeddedness within the regime
Latency	State-level nuclear latency	State-level embeddedness within the regime

membership. Joining various agreements and conventions within the regime signals to others that a state is a safe recipient of nuclear technology, encouraging nuclear supply. This dynamic means that the net effect of the regime may be to encourage the development of nuclear technology, if not of nuclear weapons, with complicated long-term implications for nuclear nonproliferation goals. A clear-eyed assessment of the regime must grapple with the possibility that it actually serves its stated purpose – preventing acquisition of nuclear weapons while at the same time promoting a latent nuclear capability in member states.

The seeming success of the nonproliferation regime, then, relies on states using the membership and compliance of others as a signal about regime effectiveness, discerning the preferences of individual countries by the parts of the regime they choose to join. This information affects state decisions to join, comply, and enforce violations, and helps determine the overall impact of the regime on states' nuclear development. Table 1.1 summarizes the variables examined in this book. I hypothesize that the behavior of the population of member states at the regime level affects state decisions to join and comply with the regime. To explain enforcement and nuclear latency, I focus on individual countries' membership decisions within the regime.

Existing Studies of the Nuclear Nonproliferation Regime

The extensive, ongoing debate among policymakers and analysts about the health, effectiveness, and future prospects of the nuclear nonproliferation regime has not always been matched by scholarly attention to the regime. In a comprehensive review of the nuclear proliferation literature, Sagan identified “how the nonproliferation treaty works” as a key puzzle left understudied.²⁴ Scholars have taken up the call; several studies in recent years have directly evaluated regime effectiveness, and a number of others address the NPT or the nonproliferation regime in passing – considering treaty membership as one of many possible drivers of nuclear restraint, for example. While the regime no longer represents as glaring a gap in the academic literature as it once did, important questions remain understudied, including when and why states choose to join, the specific mechanisms by which the regime might constrain state behavior, under what conditions states will face punishment for violations, and the overall effect of the regime on states’ acquisition of dual-use nuclear technology.

Most fundamentally, perhaps, the literature stands divided on the central question of whether the regime works at all. While the most recent scholarship has found that the NPT does have some effect on limiting the spread of nuclear weapons, this work is pushing back on a vast literature that largely comes to the opposite conclusion.²⁵ This perspective owes something to a long history of international security scholarship that discounts the role of international institutions.²⁶ For some realist scholars, states merely join the NPT and related institutions once they have decided they have no interest in nuclear development;²⁷ in international institutions parlance, the NPT may screen rather than constrain.²⁸ This view is echoed by a substantial body of work in nuclear proliferation that focuses on the decisions of individual states to seek nuclear weapons. Scholars conducting detailed case

²⁴ Sagan 2011.

²⁵ Walsh 2005; Fuhrmann and Lupu 2016; Coe and Vaynman 2015. Sagan (2011) writes that the idea that “the NPT does not have significant effects on the likelihood of proliferation” is a rare point of agreement between qualitative and quantitative scholars.

²⁶ Mearsheimer 1994.

²⁷ Betts 2000.

²⁸ Simmons 2010; Simmons and Hopkins 2005; von Stein 2005.

studies of nuclear behavior have struggled to identify a constraining role for the regime.²⁹ Hymans, for example, concludes that “the non-proliferation regime simply cannot support the explanatory weight it has been asked to bear.”³⁰ While crediting the regime with some success, Solingen writes that “a sometimes unquestioned lore often assigns far more weight to the NPT as the chief motive for nuclear decisions and outcomes than is warranted by extant empirical findings.”³¹

The recent nuclear proliferation literature has been characterized by a debate between demand- and supply-side theories. On the demand-side, scholars point to the motivations for nuclear pursuit. Security concerns have long been seen as the most fundamental reason for states to seek the bomb,³² and alliance ties with nuclear weapons states may help to mitigate the security concerns that lead to proliferation.³³ Supply-side theories of nuclear proliferation emphasize underlying nuclear capability or the provision of nuclear assistance by other states or international organizations. By lowering the barriers to a successful nuclear weapons effort, nuclear assistance may make states more likely to take the initial step and launch a nuclear weapons program.³⁴ Gartzke and Kroenig have argued that “the supply-side factors that enable nuclear development are among the most important determinants of nuclear proliferation.”³⁵ This theoretical debate has largely excluded any discussion of the role of the nonproliferation regime, except perhaps in its ability to affect nuclear supply.³⁶

The academic literature has in recent years increasingly adopted a quantitative approach to studying nuclear proliferation. Statistical studies of nuclear proliferation can be said to address the nonproliferation regime in a sense, because they frequently include NPT

²⁹ Hymans 2006; Hymans 2012; Mehta 2020; Paul 2000; Reiss 1988; Solingen 2007. An important exception is Rublee 2009a.

³⁰ Hymans 2006, 7.

³¹ Solingen 2007, 266.

³² Debs and Monteiro 2017; Monteiro and Debs 2014; Sagan 1996.

³³ Bleek and Lorber 2014; Gerzhoy 2015; Lanoszka 2018; Reiter 2014.

³⁴ Brown and Kaplow 2014; Fuhrmann 2009a; Fuhrmann 2012; Kroenig 2009b; Kroenig 2010.

³⁵ Gartzke and Kroenig 2009.

³⁶ Brown and Kaplow 2014; Gibbons 2020.

membership as a control variable in quantitative models.³⁷ But this work generally declines to theorize about the regime's effect on outcomes of interest, and it is difficult to know how to interpret quantitative results associated with NPT membership in the absence of some understanding of the selection mechanism that leads states to join in the first place.³⁸ The few existing quantitative studies that address membership in the regime and sanctions or attacks against nuclear capabilities have not sought to address the dynamics of the regime's functioning more broadly.³⁹ One central contribution of this book, then, is to reassert the importance of the nonproliferation regime in studies of nuclear proliferation and restraint. Both supply- and demand-side theorists miss an essential element of states' nuclear decision-making. The nuclear nonproliferation regime is not just overlooked in these studies, it represents an omitted variable that casts existing results in a different light.

Work that does focus on the nonproliferation regime generally adopts one of four theoretical approaches. First, some scholars point to domestic political factors to explain the regime's constraining effect or the decision of states to join. This approach echoes a substantial literature in international institutions, in which institutions are seen as mobilizing domestic constituencies to spur membership, and activating domestic reputational effects or linking to domestic institutions to ensure compliance.⁴⁰ While security institutions tend to activate fewer domestic constituencies than do economic institutions, domestic nuclear industries did play a role in the decision to join the NPT in some states, and advocates of nuclear restraint might plausibly use the international legal structures created by the regime to pressure governments to join and comply.⁴¹ Domestic institutions also may make cheating on regime commitments more costly, pushing more

³⁷ Among quantitative analyses that find some effect for the regime, see Bleek and Lorber 2014; Brown and Kaplow 2014; Fuhrmann 2009a; Jo and Gartzke 2007. For a review, see Fuhrmann and Lupu 2016.

³⁸ Fuhrmann and Lupu 2016.

³⁹ On regime membership, see Way and Sasikumar 2004. On sanctions or attacks against nuclear capabilities, see Fuhrmann and Kreps 2010; Miller 2014b; Miller 2018.

⁴⁰ See, for example, Cortell and Davis 1996; Dai 2005; Lupu 2013; Mansfield, Milner, and Rosendorff 2002.

⁴¹ Quester 1973; Sagan 1996; Walsh 2005.

accountable leaders to avoid joining the NPT in the first place if a nuclear weapons program is contemplated.⁴²

While domestic politics undoubtedly plays an important role in nuclear decision-making, in most cases it is difficult to point to specific domestic constituencies that are activated by the nonproliferation regime. This is particularly an issue in nondemocracies, where the decision to join or abstain from the NPT or to forgo or pursue nuclear weapons may be made by a leader alone or with only a small group of advisors.⁴³ It is among nondemocracies that we see the most significant variation in nonproliferation regime membership and compliance. Domestic theories of regime effectiveness have trouble explaining this variation.

Second, several studies emphasize the role of the United States and the Soviet Union in driving membership and compliance with the regime.⁴⁴ As the original drafters of the NPT, the superpowers had a clear interest in pushing their allies and dependent states to join. Erickson and Way, for example, suggest that the United States and Soviet Union may have offered a “signing bonus” to NPT members in the form of greater conventional arms transfers.⁴⁵ The United States, in particular, may have been essential in pushing countries to take on additional commitments that grant international inspectors access to their nuclear facilities.⁴⁶

US and Soviet pressure certainly had an important effect on the decisions of countries to join various aspects of the regime and even to remain in compliance, but superpower support for the regime can sometimes be overstated.⁴⁷ The United States, for example, has frequently made foreign policy decisions that seem to privilege bilateral relations over concerns about bolstering the regime, including, just in recent years, the signing of a nuclear cooperation agreement with India and the withdrawal from the Joint Comprehensive Plan of Action (JCPOA) designed to limit Iranian nuclear development. Pressure from the United States has not been enough to prevent US allies from

⁴² Fuhrmann and Berejikian 2012.

⁴³ Way and Weeks (2014) find that personalist dictatorships, which place fewer constraints on a leader’s action, are more likely to pursue nuclear weapons.

⁴⁴ Coe and Vaynman 2015; Paul 2003.

⁴⁵ Erickson and Way 2011.

⁴⁶ Gibbons 2022.

⁴⁷ I make this argument in more detail in Chapter 3.

frequently diverging from US nonproliferation policy when it comes to nuclear trade.⁴⁸ And key US allies, such as Saudi Arabia, have been noticeably reluctant to adopt more stringent international nuclear safeguards.⁴⁹

Third, research identifies the instantiation of international norms against nuclear proliferation as an important aspect of the regime's influence on nuclear behavior.⁵⁰ The regime may help states to give up nuclear aspirations by creating a normative space for nonproliferation, by making NPT membership an indicator of good citizenship in international affairs, and by building trust in fellow member states.⁵¹ The norm embodied in the regime may actually persuade member states, changing their preferences in a way that moves beyond concerns about being punished for violations.⁵²

Normative theories are unique among existing approaches in their ability to address changing dynamics within the nonproliferation regime over time. But norms-based arguments are more compelling in their explanations for regime successes than they are for regime failures. In emphasizing a mechanism of persuasion, for example, Rublee expects nonproliferation behaviors to persist even if the regime does not.⁵³ I argue, in contrast, that the ups and downs of the regime lead to corresponding ups and downs in outcomes of interest, with little of the "stickiness" we would expect if the norm instantiated by the regime persuades states to change their underlying preferences.

Finally, scholars argue that mechanisms specific to the institution may affect state decisions to join the regime or seek nuclear weapons. While the recent international organizations (IO) literature has mostly focused on institutions in substantive areas other than security, such as international trade, finance, human rights, and the environment, some work has applied modern IO theory to the nonproliferation regime. Institutionalist scholars have long emphasized the role of international organizations in providing the information that makes compliance

⁴⁸ Schwartz 2014.

⁴⁹ Hibbs 2018; Perkovich 2008, 230–231.

⁵⁰ Carranza 2019; Müller and Schmidt 2010; Rublee and Cohen 2018.

⁵¹ Budjeryn 2015; Ruzicka and Wheeler 2010; Sagan 1996.

⁵² Rublee 2008; Rublee 2009a.

⁵³ Rublee 2008. Some forms of norm-contestation theory see norms as somewhat more transient (Carranza 2019).

possible;⁵⁴ the monitoring and verification mechanisms within the nonproliferation regime may serve that function for NPT member states.⁵⁵ Specific clauses in the NPT may represent a form of flexibility mechanism that allows some states to join that would otherwise abstain.⁵⁶ Several studies suggest that the regime makes nuclear pursuit more costly in a variety of ways, ultimately affecting which states decide to join and leading more states to choose a path of nuclear restraint.⁵⁷

My approach, like that of some institutionalist scholars, emphasizes the role of the regime in providing information that resolves uncertainty. My theory, however, looks beyond the design features and treaty language of the institutions within the regime, as well as factors specific to individual states, to focus on the aggregate behavior of the wider population of member states and what that information reveals about the efficacy of the regime.

In this book, I focus less on what the regime *does* and more on how it is *perceived*. Some readers might see this approach as minimizing the role of the regime, but I find substantial evidence in these pages that aspects of the regime, such as verification and monitoring and limits on supply, have concrete effects on states' nuclear decision-making; these mechanisms are clearly important. But more than detail the workings of the regime itself, I seek to illuminate the politics of regime credibility. This dynamic of the regime is both woefully understudied and, I argue, essential for understanding how the regime actually functions. How the regime is seen by the international community – would-be members, staunch adherents, and weapons aspirants alike – is a primary determinant of its effectiveness. In at least this way my approach has more in common with normative studies of the regime than with institutionalist work. While I lay out my argument with a cost/benefit framework familiar from rationalist approaches, my primary explanatory variable is the idea of the regime, both perceptions of its strength and the information it conveys about its members, and my central argument is that the idea of the regime matters in nuclear decision-making.

⁵⁴ Keohane 1984; Smith 1987.

⁵⁵ Dai 2002; Dai 2007.

⁵⁶ Kaplow 2015; Koremenos 2001.

⁵⁷ Spaniel 2019; Thayer 1995; Way and Sasikumar 2004.

Of course, how the regime is perceived is closely related to what the regime does. Perceptions of regime strength are likely to reflect actual regime strength. Joseph Cirincione has memorably commented that “[t]he nonproliferation regime is like a pyramid scheme . . . It works as long as everyone believes in it. As soon as they stop doing that, it collapses.”⁵⁸ Although I agree with the sentiment that perceptions of the regime matter, there is real substance at the center of these institutions; my focus on how the regime is seen by the international community should not elide the importance of its work. Sometimes, though, there is a gap. Perceptions run ahead of the underlying ability of nonproliferation agreements to identify violations or constrain states. Members must guess at the extent of compliance or the likelihood of enforcement. At those times, the regime starts to look more like Cirincione’s pyramid scheme; the way the regime is perceived becomes a better guide to whether it will work.

A Shift in Perspective

This shift in focus – away from state-level factors and toward the aggregate behavior of members and the signals sent by regime membership – is important for several reasons. First, it casts informational theories of international cooperation in a new light. Scholars have long sought to explain international institutions with theories of information provision. Information reduces uncertainty in interactions between states, facilitating the reciprocal strategies that overcome collective action problems,⁵⁹ and it feeds into domestic processes that drive compliance with international organizations.⁶⁰ But when it comes to the track record of the nonproliferation regime or the pattern of membership within the regime, information can cut both ways. The sometimes-poor track record of the NPT provides information that makes both membership and compliance less likely. The underlying policy preferences revealed by membership in the regime can lead to states being targeted for economic sanctions or acquiring nuclear technology that exacerbates their proliferation risk.

⁵⁸ Pan 2005.

⁵⁹ Keohane 1984; Oye 1986.

⁶⁰ Dai 2005; Lupu 2013; Milner 1997.

Second, a focus on the behavior of the population of member states more closely captures the dynamism of the regime and connects theory to the real-world concerns of the nuclear nonproliferation community. Existing approaches to the study of international organizations often point to domestic legal mechanisms or the design characteristics of an institution itself as drivers of compliance; but both factors change slowly or not at all, and so have trouble explaining the shifts in membership, compliance, and enforcement that we see in the regime over time. And our usual focus on the characteristics of states that lead to involvement with international institutions provides little to help policymakers concerned about building momentum toward membership, or simply focused on maintaining the credibility of the regime. These concepts – momentum and credibility – imply a dynamic interplay of state decision-making and time that is not easily captured by our usual analysis of static state- and regime-level characteristics. My approach also allows for an analysis of the regime that considers equilibrium levels of cooperative behavior and virtuous or negative cascades that can help or harm regime effectiveness.

Third, understanding the importance of the aggregate behavior of member states goes some way toward reconciling what seems at first to be a contradictory discourse about the past success and impending failure of the regime. If the effectiveness of the regime depends on positive signals from the behavior of others, then it is easier to see how the regime's success and fragility can coexist. At least some of the constraining power of the regime may be more an emergent property of the decisions of its members than due to any design characteristic of the institution. Even at the height of its effectiveness, the regime may only be a few defections away from spiraling toward abstention and noncompliance.

Also in need of reconciling are two possible responses to the argument I advance here. There is a risk that some, particularly nuclear scholars or those in the policy community, will find my argument self-evident. Of course, these readers would argue, states will look to whether others are joining or complying when making their own decisions within the regime – it would be odd to assume states miss such an obvious source of information. Neither the academic nuclear proliferation nor international organizations literatures, however, have examined the aggregate behavior of regime members as a driver of state-level decision-making within the regime. The failure to

adequately account for the regime in the existing literature is problematic; regime membership and compliance are frequently omitted variables in studies of nuclear weapons pursuit, for example. If, as seems plausible, behavior within the regime affects both proliferation and other variables of interest – alliance ties, say, or the provision of nuclear supply – then our conclusions about these other drivers of proliferation may be suspect. For those who arrive here already convinced of my central findings, I can at least offer a clearer articulation than exists in the literature of the causal logic behind state decisions to join, comply with, and enforce the rules of the institution.

I fear that another group of readers, particularly scholars who specialize in international security, will find that my argument strains credulity. Of all the important drivers of international behavior, these readers would argue, are we really to believe that the aggregate behavior of regime members has an impact on nuclear weapons decision-making? My response is that I claim no exclusive role for the non-proliferation regime. Decisions related to regime membership and compliance, including the decision to exercise nuclear restraint, are undoubtedly multicausal; I argue only that the behavior of the population of member states has a substantively important effect on state decision-making within the regime and that by ignoring it we miss an essential part of the story. As one piece of evidence, I offer the fact that policymakers spend significant time and energy attempting to influence perceptions of the strength of the regime. Although policymakers can certainly be wrong about what factors matter in international relations, pervasive concerns about the credibility of the regime and efforts to build momentum in its favor at least suggest some disconnect between theory and practice that deserves our attention. Fundamentally, of course, whether particular factors affect state behavior within the regime is an empirical question, and the remainder of this book is my attempt to prove the case.

This book has something useful to offer international relations scholars in the subfields of international security and international organizations, as well as policymakers focused on limiting the spread of nuclear weapons. My arguments synthesize work from two fields of study, international security and international institutions, to draw out new insights that affect both research traditions. For security scholars and analysts concerned with nuclear weapons, I offer new, institutional drivers of nuclear proliferation and restraint that have not been

addressed by existing work. Scholarship in this area has focused largely on state or dyadic characteristics to explain weapons pursuit, and so misses an important factor influencing proliferation decisions.

The regime itself is an oft discussed but rarely studied institution; many scholars of nuclear proliferation mention its possible impact before dismissing it in favor of other factors. This work represents a book-length antidote to that tendency, offering an in-depth treatment of the many dimensions of the regime and how they may function to affect outcomes of interest to nuclear scholars and analysts. While this book is not a full-throated defense of the regime as a bulwark against nuclear proliferation, it is an argument that the regime deserves consideration as a major force in nuclear politics.

I contribute to scholarship on international organizations in a broad way simply by devoting attention to international organizations in the security domain, which have largely evaded in-depth treatment by both security and institutions scholars. This book is among very few that apply insights from IO theory to security institutions, and it is unique in taking this approach to analyzing the nuclear nonproliferation regime. In doing so, it helps to tie security regimes to the wider body of IO theory. My arguments build on contemporary theory and debates in the discipline, including whether there is a trade-off between breadth and depth in international institutions, the effects of regime complexity, the drivers of selective enforcement, the differential benefits that accrue to members of international organizations, and the question of whether institutions constrain or screen. By applying these theories to the case of the nuclear nonproliferation regime, I help to delineate the boundaries of their explanatory power.

I also offer an important contribution to ongoing policy debates on nuclear proliferation. The efficacy of the nonproliferation regime is a perennial worry for policymakers and analysts. The book combines a rigorous assessment of the dynamics of the regime with a discussion of policy options for adapting the regime to address future proliferation challenges.

Methods and Scope

Throughout this book, the nuclear nonproliferation regime serves as a kind of quantitative case. I advance theories about the functioning of the institution and the decision-making of states within it, and I test

these theories using quantitative data on regime membership, compliance, verification, and enforcement.⁶¹ While I use many examples from the experience of individual countries to illustrate the mechanisms described in the book, drawing from declassified documents and other archival sources, the primary mode of inference relies on large-*n* quantitative models. Because this is not the typical approach in studies of the nuclear nonproliferation regime, it merits a brief discussion here.⁶²

I adopt a primarily quantitative approach for two reasons. First, the role of the nonproliferation regime in state decision-making is one area in which we might expect a paucity of useful case evidence. Qualitative studies of the effect of the NPT run into the same methodological challenges as studies of nuclear weapons proliferation generally. Nuclear weapons programs are among a state's most closely guarded secrets; the decision-making process is often restricted to a small group, documentation frequently limited, and dissemination after-the-fact generally rare or heavily redacted. The heroic efforts of archivists, historians, journalists, and other nuclear researchers have led to tremendous progress over the last decade in gaining public access to previously restricted, declassified documents from several countries, and I happily take advantage of these newly available records in this book, but these documents still represent a heavily biased sample, omitting more recent events and skewing toward democratic and Western countries.⁶³

More generally, we might not expect the role of the nonproliferation regime to surface explicitly in discussions of nuclear decision-making for most states. The regime forms a kind of backdrop for state behavior; its influence is felt through countries' threat perceptions,

⁶¹ See the Appendix for a discussion of the nuclear pursuit data I employ throughout the book.

⁶² Most prominent studies of nuclear restraint use a comparative case study method, although it is worth noting that most such studies find that the nuclear nonproliferation regime has little effect on state decision-making. See, for example, Hymans 2006; Paul 2000; Reiss 1995; Solingen 2007. For a defense of the use of statistical methods to study nuclear issues, see Fuhrmann, Kroenig, and Sechser 2014; Gartzke 2014; Gartzke and Kroenig 2017. For important critiques of quantitative approaches, see Bell 2016; Gavin 2014; Montgomery and Sagan 2009; Narang 2014.

⁶³ Of course, at some point the absence of evidence does become evidence of absence. The relative lack of case evidence to support the central role of the nonproliferation regime in states' nuclear decision-making, for example, represents a strong mark against institutional theories of nuclear restraint.

assessments of nuclear capabilities and supply, and position within the web of international security institutions.⁶⁴ When the NPT is working, countries are likely to feel less threatened by the potential for others to pursue nuclear weapons, and so are less likely to pursue weapons themselves, even if leaders fail to call out the regime in so many words during their deliberations. The risk of falling under the radar is particularly acute for the nuclear nonproliferation regime because of the interplay between the NPT and state capabilities over time. The cases given the most attention by scholars studying the regime tend to be those of capable states deciding whether to join the NPT. But many states joined the treaty before they had a plausible path to future nuclear weapons work. The regime changes the nuclear weapons calculus for these states nonetheless, potentially to the point that future leaders of these states decline to even engage in a serious discussion of weapons pursuit.

Second, a quantitative approach seems most useful in capturing the broad, probabilistic effects of the regime that are the outcomes of interest for this book. Our interest is naturally drawn to the edge cases, the ones with acknowledged strategic significance. Such cases are clearly important, but they may be less than representative. Large-*n* analysis helps combat the tendency to focus on these prominent outliers – Iran and North Korea come quickly to mind – and reorient analysts toward the broader trends within the regime. It may be that the regime is a less useful tool in dealing with the most difficult states, but that does not mean the regime is ineffective for the quiet majority of cases. In the end, I see quantitative findings of the kind advanced in these pages as a useful complement to the qualitative studies of individual state decision-making that are more common in the field.

Throughout the book, I pair quantitative analysis with qualitative vignettes drawn from declassified documents, archival materials, and secondary sources. Unlike traditional case studies, these examples are not intended to be tests of theory, but instead are simply meant to demonstrate the plausibility of my arguments. One way to establish that my arguments are plausible is to show that officials considered the factors highlighted by theory, and the vignettes frequently take this form.

⁶⁴ Fuhrmann, Kroenig, and Sechser (2014) make a similar argument.

Beyond the Nuclear Nonproliferation Regime

The nuclear nonproliferation regime has been credited with limiting the spread of the world's deadliest weapons, and so seems to merit study in its own right. But the theory and empirical tests in this book engage with and extend research by scholars working on international institutions generally and on international security institutions in particular. International security institutions occupy a unique position in the IO literature. Security treaties, along with the US tendency toward multilateralism in security affairs, drove much of the early literature on the efficacy of international institutions, but the focus of the literature has now moved decidedly into other realms, particularly trade and human rights institutions. One reason for the lack of attention devoted to international security organizations may be that nearly all theoretical traditions see security institutions as much less likely to engender cooperation among states than those in other issue areas.⁶⁵ Security, first and foremost, is the arena in which states most jealously guard their sovereignty; security issues touch on existential considerations in a way that trade, the environment, and human rights rarely do.

The nuclear nonproliferation regime is a useful testing ground for theories of international security institutions for several reasons. First, the central puzzle of the nuclear nonproliferation regime, its seeming success in the face of weak institutional design, applies just as well to most other international security institutions. Second, the regime experiences significant variation over time in key explanatory variables such as the track record of the NPT and the strength of verification measures, as well as in outcomes of interest such as compliance and membership. Further, there is significant variation among states in terms of their portfolio of memberships within the regime. This variation provides some empirical leverage in investigating broader questions about the drivers of membership, compliance, and enforcement within security institutions.

Finally, the NPT represents a hard case for theories that see institutions as constraining state behavior. The nonproliferation regime is not asking members to make small adjustments to domestic policy or implement minor trade concessions. Instead, it demands that member states forgo a powerful and desirable military capability that, for some

⁶⁵ For a review, see Duffield 2008.

states at least, could be the difference between maintaining national security and facing an existential threat. If the nonproliferation regime affects state behavior at this level of “high politics,” then we might expect institutions with less demanding obligations to have a constraining effect as well.

Plan for the Book

This chapter and the next introduces my argument, discusses the contribution of the book, and highlights the core puzzle of the nuclear nonproliferation regime. The next four chapters each address different aspects of the regime: membership, compliance, enforcement, and provision of nuclear latency. For each, I explain how my theory applies to this area of the regime, derive specific hypotheses, and subject these hypotheses to quantitative tests.

Over the last fifty years, the nuclear nonproliferation regime has endured its share of challenges. Despite often seeming just on the threshold of failure, it has emerged relatively unscathed. Chapter 2 explains this puzzle of the nonproliferation regime. I provide a brief history of the regime, with a focus on changing perceptions of regime effectiveness. I describe the pattern of pessimism about the regime’s prospects in both policy and scholarly circles, and the regime’s surprising success.

Scholars often point to pressure from the United States as a key factor in driving membership in the nuclear nonproliferation regime, but this explanation glosses over years of US ambivalence about the NPT and has trouble explaining the changes we see in patterns of membership over time. In Chapter 3, I argue that variation in the perceived effectiveness of the regime – as indicated by high levels of membership, strong verification measures, effective enforcement, and a history of compliance – better explains why states join. Most member states are reluctant to forgo nuclear weapons without assurances that others will comply as well, and signals of regime effectiveness reassure states that their commitments will be reciprocated. This argument runs counter to the conventional wisdom among IO scholars, that there is a “depth versus breadth” trade-off in institutional design. I test this theory using data on state membership in the NPT, along with data on four new indicators of the perceived effectiveness of the regime.

In Chapter 4, I identify the track record of the regime – its recent history of compliance – as a key driver of the decisions of states to abide by their nonproliferation commitments. Members face significant uncertainty surrounding the regime's effectiveness, and new information about the performance of the regime will help resolve uncertainty and influence compliance. The track record of the regime provides the best source of such information. As time passes with few violations, states will in turn be more likely to comply themselves. Evidence of high levels of noncompliance, on the other hand, will make states more likely to cheat. I offer a statistical test of this theory using data on nuclear weapons programs by NPT members.

The nuclear nonproliferation regime lacks formal enforcement mechanisms, but this does not mean that violations of nonproliferation commitments always go unpunished. States that violate the NPT routinely face pressure from others to change their behavior, including through economic sanctions. But the lack of formal enforcement measures does contribute to significant variation in the states that are targeted for punishment – enforcement is always at the discretion of the punishing state. Why do some states face punishment while the transgressions of others are overlooked? Beginning in Chapter 5, I shift the focus from the aggregate behavior of member states to the signal sent by embeddedness within the regime. I argue that enforcing states look to the policy preferences of violators for signals about the likelihood that enforcement will change state behavior and about the cost to the international community of allowing the violation to continue. Patterns of institutional membership within the larger regime help to credibly reveal the preferences of state parties. Using data on membership in the various agreements that make up the nuclear nonproliferation regime, I show that violating states are actually less likely to face costly enforcement action the more embedded they are within the regime.

A core promise of the nuclear nonproliferation regime is that it will provide nonnuclear weapons states with access to civilian nuclear technology. At the same time, nonproliferation advocates see the regime as a major tool in limiting the development of this dual-use technology and the spread of nuclear weapons. Chapter 6 examines the effect of membership in the nonproliferation regime on nuclear latency – the underlying capability to quickly acquire a nuclear weapon. Using data and findings from the previous chapters, I show

that regime membership, for all its positive effects, comes at the cost of contributing to members' latent nuclear capability.

Chapter 7 summarizes the book's central argument and expands on the policy implications of the study. The preceding chapters, for example, suggest that the perceived weakness of the nuclear nonproliferation regime could act as a proliferation trigger, pushing states to take that final step toward nuclear pursuit. This raises the stakes for policymakers in maintaining the credibility of the regime by reassuring allies, committing to punishment of violators, and closing persistent regime loopholes. At the same time, the link between regime membership and latent nuclear capability suggests that confidence in the constraining power of the nonproliferation regime could give us a false sense of security. Iran's nuclear development in recent years is a stark reminder that the regime – as it currently stands – was not designed to prevent states from acquiring a nuclear capability just short of a weapon.