Going Nuclear: Does the NPT Matter?
Case Studies in Nuclear Weapons Decision-Making

A Thesis
submitted to the Faculty of the
Graduate School of Arts and Sciences
of Georgetown University
in partial fulfillment of the requirements for the
degree of
Master of Arts
in Security Studies

By

Jonathan D. Bergner, B.A.

Washington, D.C.
April 15, 2011
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>The Nuclear Non-Proliferation Treaty</td>
<td>2</td>
</tr>
<tr>
<td>Conceptual Frameworks</td>
<td>5</td>
</tr>
<tr>
<td>Four Case Studies</td>
<td>8</td>
</tr>
<tr>
<td>South Korea</td>
<td>9</td>
</tr>
<tr>
<td>Argentina</td>
<td>15</td>
</tr>
<tr>
<td>Brazil</td>
<td>20</td>
</tr>
<tr>
<td>Libya</td>
<td>25</td>
</tr>
<tr>
<td>Importance of Security</td>
<td>30</td>
</tr>
<tr>
<td>Conclusion</td>
<td>33</td>
</tr>
<tr>
<td>Bibliography</td>
<td>36</td>
</tr>
</tbody>
</table>
INTRODUCTION

The proliferation of nuclear weapons is one of today's major global security concerns. In the early 1970s, the international community negotiated and adopted the Nuclear Non-proliferation Treaty (NPT) to address this threat. The NPT was intended to provide a sense of collective security by means of signatories signaling their intention to eschew nuclear weapons. The treaty sets out a commitment for the five recognized nuclear weapon states (the U.S., Russia, China, Great Britain, and France) to neither sell nor provide nuclear weapons technology and to agree to negotiate "in good faith on effective measures relating to the cessation of the nuclear arms race at an early date and to nuclear disarmament."\(^1\) It was thought that if the nuclear "haves" adopted a policy of eventually eliminating their own arsenals, non-nuclear states would feel less threatened and therefore be more likely to fulfill their commitment not to pursue nuclear weapons technology. In return for their forbearance, the treaty affirms the non-nuclear states' right to use nuclear energy for peaceful civilian purposes as long as they abide by safeguard protocols as prescribed and administered by the International Atomic Energy Agency. It also calls for the facilitation of the "fullest possible exchange of equipment, materials, and scientific and technological information" to further incentivize the nuclear "have-nots" to sign the treaty.\(^2\)

Currently the NPT has 189 signatories. One state has signed and subsequently withdrawn (North Korea), and three states have never signed the NPT (Israel, India, and Pakistan).

The NPT is the most widely agreed to arms control treaty in history. Since its inception it has been held up as the lynchpin of international efforts to curtail the spread of nuclear weapons by constraining state behavior. In a time of great concern and uncertainty regarding what to do about proliferation in countries such as Iran there is a need to reflect on what the NPT regime has

\(^2\) Ibid.
and has not accomplished, what it does and does not do, and what it can and should do, in an attempt to analyze what role it might play in the twenty-first century. For example, NPT regime proponents perceive it to be losing force in recent years and fear that this will result in more states acquiring nuclear weapons technology. This concern assumes that the NPT plays a direct and meaningful role in the decision of states to forego acquiring nuclear weapons. On the other hand, skeptics argue that the NPT regime is largely ineffectual when it comes to the important cases, i.e. states that actively seek to acquire nuclear weapons.

This paper analyzes the nuclear motivations of certain states that have pursued and then abandoned nuclear weapons programs in the NPT era. It considers various theoretical frameworks in the proliferation literature and applies those to a key set of cases---South Korea, Argentina, Brazil, and Libya. The results of the research suggest that while the nuclear decision-making calculus is a complicated one with many and varied inputs, it is possible to analyze the interplay between the myriad drivers and motivations to determine their relative importance. Because of the centrality of security concerns to nuclear decision-making, the NPT as currently structured appears not to have a meaningful impact in these cases. Therefore, this paper suggests that non-proliferation efforts should focus on addressing the security concerns of problem states and work directly with those states to provide incentives and disincentives to nuclear acquisition to alter their calculations of the utility of nuclear weapons.

**THE NUCLEAR NON-PROLIFERATION TREATY**

The NPT was opened for signature in 1968 with the United States, Russia, China, Great Britain, and France as recognized nuclear states. In the intervening years only four states---Israel

---

(undeclared), India, Pakistan, and North Korea---have gone nuclear. Every other state in the world has become a signatory and foregone acquiring nuclear weapons (at least to date). As opposed to the "nuclear cascade" or "tipping point" scenarios predicted by many, a drastic increase in the number of nuclear states has not materialized. Some proponents of the NPT argue that this is the result of the institutions such as the safeguards regime put in place by the IAEA.

Skeptics of the value of the NPT regime point to other evidence. The NPT did not prevent Israel, India, and Pakistan from simply ignoring the treaty and acquiring the nuclear weapons they believed necessary for their security. The NPT did not prevent North Korea, a signatory, from doggedly developing its nuclear weapons program all the while supposedly under IAEA supervision and then withdrawing from the treaty and exploding a nuclear device. Perhaps most damaging, if Iran---also a signatory---is in fact developing a nuclear weapons capability as the United States and others fear, the NPT appears powerless to halt these efforts.

However, it might be the case that the NPT is critically important for the vast majority of other states that have neither acquired nor sought to acquire---or decided to abandon---active nuclear weapon programs. This argument suggests that the non-proliferation regime has prevented nuclear acquisition from even being contemplated by some states and "the vast majority comply with their [NPT] obligations because they believe in non-nuclear rules and norms and the value of global nuclear governance." There are problems with this assertion. First and most obviously, there is no empirical evidence to support it. However, Ogilvy-White's

view seems to characterize support of the NPT for the NPT's sake that colors much of the non-proliferation literature. Barry Posen assumes that Iran going nuclear will "surely damage the NPT" by making others lose confidence in the system.9 Underlying this type of argument is the assumption that "the nonproliferation regime plays an important role in framing the balance of factors that states consider when determining their nuclear weapons policies."10

The fact is the vast majority of states comply with their NPT obligations because they have no other realistic option---they have no nuclear capability and little means to acquire it. It is cheap to join the regime under these circumstances. In setting up a nuclear non-proliferation regime the concerns/beliefs/motivations of this type of non-nuclear state should be secondary. As one scholar put it, the appearance of the regime's success stems from the fact "that few state leaders have desired the thing it prohibits."11

The real value of a successful non-proliferation regime is to be found in its ability to influence those states and leaders that want nuclear weapons and can find the means to acquire them. It is in these more interesting cases that almost every instance of nuclear restraint or reversal was made "prior to, rather than as a consequence of, the decision to ratify the NPT."12 In other words, it could not have been said to be a meaningful factor in the nuclear decision-making calculus. It clearly meant little to those signatory states that were/are pursuing nuclear weapons programs. A look at the history of the nuclear weapons programs in South Korea, Argentina, Brazil, and Libya confirms this assertion.

---

12 Potter and Mukhatzhanova, "Nuclear Intentions," 156.
CONCEPTUAL FRAMEWORKS

This paper will build on several concepts found in the nuclear decision-making literature. First, in "Determinants of Nuclear Weapons Proliferation," Dong-Joon Jo and Erik Gartzke argue that when it comes to a state seeking to acquire nuclear weapons there must be both willingness and opportunity.\(^{13}\) "Nuclear willingness" refers to a set of factors leading to the desire of a country to possess nuclear weapons. "Nuclear opportunity" includes the level of scientific and technological knowledge in a society, access to fissile materials, and the economic capacity of the society to create a workable nuclear arsenal. Braun and Chyba, in "Proliferation Rings," characterize this distinction between willingness and opportunity as demand and supply-side factors contributing to proliferation.\(^{14}\) They also argue that depending on which set of factors is the focus, nonproliferation policies will shift in significant ways. For example, if the focus is on supply-side factors, policies will include export controls, interdiction, and safeguard mechanisms for sensitive material. Demand-side oriented policies would seek to alter a state's perception of the utility of nuclear weapons.

The literature further differentiates between the demand-side or willingness factors. In "Why Do States Build Nuclear Weapons?" Scott Sagan identifies three alternative demand-side frameworks: (1) "the security model" - to increase national security against foreign threats; (2) "the domestic politics model" - using nuclear weapons as political tools to advance parochial or bureaucratic interests; and (3) "the norms model" - acquisition of nuclear weapons provides an important normative statement of modernity or identity.\(^{15}\)


\(^{14}\) Braun and Chyba, "Proliferation Rings," 7.

The security model is generally associated with the structural realist school of thought which explains nuclear decision-making in terms of an anarchical international system, the balance of power, and security dilemmas.\textsuperscript{16} It generally predicts that states facing a powerful enemy would seek to maximize their security by acquiring nuclear weapons. If one state in a power system acquired nuclear weapons, this would induce the others to follow suit.

Domestic politics models suggest that the internal character of a state has a deterministic effect on nuclear decision-making. Democratic peace theory might suggest that liberal democracies tend not to engage in armed conflict with one another and that they are also far less likely to pursue nuclear weapons.\textsuperscript{17} Etel Solingen on the other hand, a well-known domestic politics model scholar, argues that regardless of the political structure, it is regime security rather than state security that motivates leaders in a country to pursue nuclear weapons. Leaders with domestic constituencies that reject international integration "have greater incentives to exploit nuclear weapons as tools in nationalist platforms of political competition and for staying in power."\textsuperscript{18} If nuclear policies shift, it is not due to a swing in the balance of power, but to a changing domestic political landscape that favors the shift.

The norms model has to do with states' perceptions of the utility of nuclear weapons. A state may see in acquisition a chance to move into "global power" status (is it just a coincidence that the five permanent members of the United Nations Security Council are also the five "legal" nuclear weapon states under the NPT?). If the great powers of the world are seen relying on nuclear weapons as a pillar of their grand strategy, this might well establish the norm that nuclear

\textsuperscript{16} See Kenneth Waltz, "Nuclear Myths and Political Realities," \textit{American Political Science Review} 84:3 (1990): 731-745.


weapons are necessary. Conversely, a regime such as the NPT might establish the opposite norm of nuclear forbearance. In either case, individual leaders are given a more prominent explanatory role in this model—the impact of international norms "depends primarily upon the extent to which the ideas and values serve or are congruent with the interests and principles of influential domestic actors."\(^{19}\)

Importantly, Sagan claims we can apply these three models to understand decisions of restraint. For example, (1) Waltz and other neorealists would argue the most significant factor for a state which abandons its program is an improvement in its security landscape; (2) Solingen would argue that such a decision has more to do with factors such as damage to a state's economic interests, or other domestic constituencies' interests; and (3) Nye would argue that a state's forbearance when it comes to nuclear weapons can serve as just as powerful a symbol of its modernity and identity as acquisition.\(^{20}\)

The supply-side model on the other hand, has little theoretical literature regarding its effects on a state's decision to pursue or not pursue nuclear weapons. Perhaps this is because it seems obvious that the ability to build an arsenal is a prerequisite to acquisition, but not a sufficient reason for a state to decide to launch a program. Estimates vary, but it is thought there may be as many as thirty-five to forty states that do possess the requisite level of scientific and technological advancement to produce nuclear weapons but have not done so, for example, Japan or Germany.

This study targets states that both pursued a nuclear weapons program and then abandoned it and the paper focuses on demand-side factors, specifically using Sagan's


frameworks. In each of the four cases considered, I apply the three models of explanations and assess the relative importance of each set of factors.

FOUR CASE STUDIES

Although much has been written on nuclear forbearance in general, there is less in the literature about how the international community has been able to convince states to give up existing nuclear weapons programs. Given that the international community is attempting to deal with a country like Iran, which is strongly suspected of having a clandestine nuclear weapons program, a better understanding of what has caused countries in the past to abandon their programs could prove useful. That being the case, this paper focuses on once-aspiring nuclear weapon states that have peacefully terminated their weapons programs.

Stopping aspiring states from nuclear acquisition should be the central goal of non-proliferation regimes such as the NPT. Therefore the paper focuses still further on four states that had active programs during the growing NPT regime, but did not in the end acquire weapons—South Korea, Argentina, Brazil, and Libya. It does not include those states such as Australia, Italy, and Sweden that had nuclear weapons programs but gave them up prior to the regime being in place. Understanding what caused the four countries to pursue programs in the face of international pressure and spreading non-nuclear norms and then later to abandon them may provide valuable insights to non-proliferation policymakers today.

The selection of states to consider also captures a cross-section of many factors and each will be considered in the analysis—country size, economy, political systems, leadership, geographic region, culture, threat perceptions, and historical relationships with the world and their neighbors. Also, the case studies sample two countries which were early signers of the NPT, but pursued clandestine nuclear programs anyway (South Korea and Libya) as well as two
countries which acceded to the NPT only in the mid- to late-nineties (Argentina and Brazil). The sample pool is therefore very targeted, but also reflects a diversity that can help generalize the conclusions drawn from it.

While there have been analyses of these four case studies and the history of their nuclear weapons programs—which are utilized in the research—a focus on them as a separate class of aspiring states appears to be a gap in the literature. Of the almost twenty states that Levite identifies as having "tried [to get nuclear weapons] but gave up" their programs, only these four had an active weapons program that they abandoned without acquiring weapons during the NPT era. The uniqueness of this particular circumstance may well lead to new insights and add a meaningful contribution to the proliferation discussion.

SOUTH KOREA

NUCLEAR PROGRAM HISTORY

Because fossil fuels are limited on the Korean Peninsula, South Korea has historically relied heavily on nuclear energy for its needs. However, despite the high-tension regional environment it shares with its neighbor to the north, South Korea has not chosen to acquire nuclear weapons. In fact, it even continues to rely exclusively on foreign sources of nuclear fuel and does not produce any fuel indigenously. At several points in its history, it has taken steps to develop fuel-cycle technology as a part of a nuclear weapons program, although all such efforts were met with intense U.S. resistance and quickly abandoned. Today South Korea enjoys one of the most advanced and capable nuclear power sectors in the world with 20 nuclear reactors supplying 45 percent of the nation's electricity and plans to build 20 to 30 more in the next three

22 As the frame of this paper relates to the NPT, Taiwan is not included. While Taiwan is suspected of having a clandestine program through the 1970s and 1980s, it is not officially recognized as a country and therefore as a member of the NPT. Taiwan does operate under a similar, independently-negotiated IAEA safeguard regime.
decades. Mostly in partnership with the United States, its nuclear industry has developed the knowledge and technical capability to build reactors, manufacture fuel, make key nuclear components, and has become a major international supplier of nuclear goods and services. South Korea is a signatory of the NPT and its Additional Protocol, is subject to self-imposed intrusive safeguards and restrictive limits on its nuclear materials, and shows no signs of re-launching a nuclear weapons program.

South Korea made efforts to take advantage of nuclear energy in the late 1950s. It formed the Korean Atomic Energy Research Institute in 1959; by 1962 a research reactor, supplied by the United States, achieved criticality. Research continued apace for the next two decades---in 1970 the Kori-1 plant was begun and came online in 1978 as the first commercial nuclear power reactor in the country. By that time South Korea had both signed the NPT---doing so on the first day it opened for signature in 1968---and ratified it in 1975, seven years later.

Beginning in 1954, South Korea has mainly relied on the Mutual Defense Treaty with the United States to guarantee its security in the region. Not surprisingly, there is no evidence to suggest that throughout the 1960s the South Koreans had any plans to develop nuclear weapons. Beginning in 1970-71, however, several events had an effect on the country's decision to forego nuclear weapons. First, U.S. President Richard Nixon unilaterally withdrew 26,000 troops from South Korea as a part of his drawdown in Asia. The withdrawal came immediately after a series of weak American responses to provocative military actions by North Korea, which was already outspending South Korea on defense. Then in 1972, Nixon made his surprise visit to China and inaugurated a normalization of relations with the PRC. Complicating the appearance of a

---

24 Solingen, Nuclear Logics, 82-99.
wavering commitment to the region, in 1974 the U.S. rejected a request from Seoul for a larger role in nuclear planning.\textsuperscript{26}

In response to this changing security environment, President Park Chung-Hee decided to launch a clandestine nuclear program. By 1973 the Weapons Exploitation Committee (WEC) had developed and recommended a long-term plan to develop nuclear weapons in six to ten years at the cost of $1.5 to $2 billion.\textsuperscript{27} Obtaining the necessary fissile material was the main obstacle and so the WEC entered into negotiations with France to buy a plutonium-reprocessing facility, with Belgium for a fuel-reprocessing facility, and with Canada for a heavy-water reactor. When the United States found out about these plans it threatened to cut off all civilian nuclear energy cooperation and made clear that the security guarantee and troop deployment on the Korean Peninsula were forfeit if South Korea did not abandon its nuclear weapons program and sign the NPT. South Korea acquiesced, agreed to cancel the weapons project, and acceded to the NPT in 1975 in return for a reaffirmation of the U.S. security guarantee.

However, despite ratification of the non-proliferation treaty and assurances to the United States, South Korea soon seriously considered renewing its nuclear weapons program. In 1977, newly elected U.S. president Jimmy Carter began fulfilling a campaign promise to remove all American troops and 1,000 tactical nuclear weapons from South Korea. In response the South Korean Defense Ministry prepared a report for President Park that suggested they could have a nuclear weapon completed by 1981.\textsuperscript{28} There are unconfirmed reports that WEC personnel associated with the nuclear projects continued their work until the early 1980s and that Carter had again threatened sanctions if South Korea did not cease "suspicious" research activity.

\textsuperscript{27} Campbell, et al, \textit{Nuclear Tipping Point}, 262.
Regardless, the cancellation of Carter's withdrawal plans---forced largely by a deeply alarmed U.S. Congress---and Park's assassination in 1979 ensured that this nuclear weapons project did not survive.\(^{29}\)

When South Korea ratified the Additional Protocol to the NPT in 2004, it was required to disclose new information on past nuclear activities. It was revealed that from the late 1970s until the early 1980s, South Korea had continued unreported experiments with chemical uranium enrichment, uranium conversion, and plutonium separation activities.\(^{30}\) There were also newly reported laser enrichment experiments from 2000. All of these experiments occurred on a small scale and clearly did not result in an active South Korean nuclear weapons program, but they suggest a lingering interest in developing the nuclear fuel-cycle technology needed to create a nuclear weapon. Keeping an independent nuclear arsenal in mind is not altogether surprising given the track record of North Korea's noncompliance with IAEA safeguards, consistent clandestine development of nuclear weapons technology through the 1980s and 1990s, eventual withdrawal from the NPT, and the detonation of a nuclear device. Despite these provocations however, South Korea has continued to try to engage high-level leaders of North Korea while reaffirming its commitment to a nuclear-free Korean Peninsula.

*SOUTH KOREA’S DECISION*

Since the conclusion of the Korean War in 1953, tensions on the Korean Peninsula have remained high. The threat of another North Korean invasion constitutes a legitimate and serious existential threat to the South Koreans. North Korea has enjoyed allies in both the Soviet Union and China and, in the twenty years following the Korean War, conducted a massive conventional


\(^{30}\) Solingen, *Nuclear Logics*, 85-86.
military build-up. There can be no question that South Korea saw its neighborhood as threatening and, a realist theory would suggest that South Korea would do everything it could to maximize its security, including build nuclear weapons.

Yet, it did not. However, South Korea's nuclear decision-making can still be understood as being driven primarily by security concerns. One of the fundamental pillars of the South Korean response to the North Korean threat has been its alliance with the United States. This alliance put South Korea solidly under the protection of the United States through an explicit security guarantee, a deployment of U.S. troops on the peninsula, and an implicit commitment to use nuclear weapons to deter aggression from the north. \(^{31}\) The two main efforts of the South Koreans to develop the technology needed to produce a nuclear weapon both came during times of a perceived weakening of this alliance. It was following immediate and intense objections by the United States and their subsequent threats to withdraw military and economic aid, that South Korea abandoned its efforts. In both cases the United States also offered positive security assurances and publicly reaffirmed its commitment to protecting South Korea. This relationship between the U.S. security commitment and South Korea's nuclear weapons decisions has led some to suggest that South Korea launched what it knew to be destabilizing nuclear weapon programs in order to coerce the United States to abandon plans to scale back those commitments. \(^{32}\) Whatever the case, maintaining the pillar of U.S. protection was paramount and a consideration motivated chiefly by security concerns.

There were several other factors which contributed to the particular way South Korea behaved. Would the state have been so interested in launching a nuclear weapons program in the face of a declining U.S. commitment had it been a liberal democracy rather than a military

---


dictatorship under President Park? It is impossible to say for sure, but one could imagine it would have been a more difficult road in a transparent political system. Regardless, the type of regime---and even Park's leadership---did not change through South Korea's vacillation on the question of an independent nuclear arsenal. It is hard to argue that regime type was a decisive factor in this case.

Nor were the dynamics of the domestic political sphere decisive as Solingen argues. According to her, one of the fundamental goals of the Park regime was the export-led growth of the South Korean economy in order to ensure its domestic political survival. This higher level objective, she argues, was the real motivation behind abandoning nuclear weapons---to stay on good terms with the United States to help continue South Korea's economic growth. To assign the motivation behind maintaining a strong economy to the influence of domestic constituencies and the desire to remain in power, however, seems to needlessly confuse the issue. As Park himself noted, "there is an even more important reason for seeking high economic growth, and that is the need for us to maintain a position superior to North Korea in our present state of confrontation." A successful economy was seen as an integral part of a secure South Korea and the close tracking of nuclear weapons development to perceptions of the U.S. commitment to its Asian allies suggests that security-based motivations were paramount.

Finally, the NPT cannot be said to have had much of an impact. Although an early signer, South Korea ratified the NPT only following the first attempt to develop a nuclear weapons program and only at the insistence of the United States. Even when signing the NPT Park made clear that his commitment to the treaty was based on security concerns when he stated

---

33 Solingen, *Nuclear Logics*, 98.
that South Korea's membership would be contingent on a robust U.S. security guarantee.\footnote{Ibid, 85.}

During its second attempt to acquire weapons capability in the late 1970s, South Korea used its membership in the NPT regime and the IAEA safeguards in place as cover for its clandestine activities. At best, as Paul observes, "the NPT regime put constraints on the South from openly pursuing a nuclear route," but it seems clear that it did not impact its decision to abandon its nuclear weapons program.\footnote{Paul, \textit{Power}, 123.}

**ARGENTINA**

**NUCLEAR PROGRAM HISTORY**

From the beginning of its nuclear program, Argentina has employed a strategy of importing foreign nuclear technologies when necessary and fostering indigenous capabilities and infrastructure when possible. The country possesses abundant natural nuclear resources---an estimated 23,000 tons of minable uranium concentrate---and since the nuclear age began, has sought to achieve an independent mastery of the full nuclear fuel cycle.\footnote{From John Redick, "Regional restraint: U.S. nuclear policy and Latin America," \textit{Orbis} 22:1 (1978): 161-201.} A key component of the first several decades of development involved a refusal to participate in international regimes such as the NPT and a general ambiguity about acquiring nuclear weapons. Today, however, Argentina has a largely independent nuclear capability with a robust civil nuclear industry that successfully exports nuclear services and products, remains nuclear weapons-free, and participates in non-proliferation efforts such as the NPT and the Nuclear Suppliers Group.

Argentina began actively pursuing a nuclear program in 1950 with the creation of its National Atomic Energy Commission (CNEA). Launched by President Juan Peron, acquiring and mastering this new technology was a piece of a larger populist-driven program to reverse the
relative decline of Argentina's international status and make the nation more self-sufficient and less dependent on foreign countries. By 1953, the CNEA was mining uranium and had full-fledged research programs underway. Up until 1958, Argentina had received no foreign assistance on its program; then the United States built a research reactor in accordance with a nuclear cooperation agreement that had been signed three years prior.  

Although Peron was ousted in 1955, the successive military regimes maintained and expanded the Argentinean nuclear program even throughout the political and economic instability created by frequent regime change. Using plans from the initial American research reactor, the CNEA constructed three additional research reactors by 1967 and purchased a natural uranium electric reactor from West Germany in 1968. At this time Argentina was also engaged in negotiations over the NPT as well as the Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean (Treaty of Tlateloco) which established a nuclear-weapons-free-zone (NWFZ) in Latin America. Although Argentina signed the Treaty of Tlateloco, it did not ratify it and simply refused to sign the NPT, describing it as a discriminatory effort by the nuclear weapons states. It is possible that Argentina did not want to reveal the sensitive nuclear development activities it was conducting in a small reprocessing facility at one of its research reactors. This facility was closed by 1973 after faulty operations and the total production of less than 1 kilogram of plutonium from reprocessed spent fuel.

The military junta that took power in 1976 reinvigorated the nuclear program, particularly through actions that would facilitate the production of a nuclear weapon. The CNEA began construction in 1978 on a second and a third reprocessing facility. The second facility,

---

built at the Ezezia reactor, was designed to produce 10-20 kilograms of plutonium per year. Although the Argentineans claimed it would be used only for making reactor fuel, they still refused to allow IAEA inspections.\textsuperscript{41} The third facility at Pilcaniyeu operated secretly for five years and although it was designed to produce only 20 percent enriched uranium---suitable for research and reactor fuel---producing weapons-grade nuclear material there was possible in the long-run.\textsuperscript{42} Both of these efforts increased the suspicions of the international community that Argentina had a clandestine (and systematic) nuclear weapons program. During this time period, the nation's weapon systems were also becoming increasingly capable of delivering a nuclear payload. Not only were some of Argentina's military aircraft---such as the Skyhawks, Super Entendards, and the Mirage III---convertible to nuclear-capable vehicles, but it was also improving its missile technology with work on an intermediate range ballistic missile system.\textsuperscript{43}

However, the early 1980s saw the beginning of a trend toward an official commitment to non-nuclear status. In 1980 Argentina entered into a bilateral agreement with Brazil---its chief regional and nuclear rival---on the peaceful use of nuclear energy, agreeing to cooperate in the nuclear fuel cycle and to begin to coordinate their nuclear policies. The election in 1983 of Raul Alfonsin's civilian regime built upon these efforts and brought about significant policy changes: "the nuclear program was placed under civilian direction, the CNEA budget was cut, and the new government introduced legislation to prohibit the development of nuclear weapons."\textsuperscript{44} The next milestone was the Foz do Iguazu Declaration of 1985 which established bilateral confidence-building measures resulting in reciprocal visits beginning in 1987 to the most sensitive nuclear facilities in both countries. These actions paved the way for President Carlos Menem to sign the

\textsuperscript{41} Cirincione, et al, \textit{Deadly Arsenals}, 385.
\textsuperscript{43} Paul, \textit{Power}, 105.
\textsuperscript{44} Cirincione, et al, \textit{Deadly Arsenals}, 385.
Declaration on the Common Nuclear Policy of Brazil and Argentina in November of 1990 which established mutual verification and inspection procedures and a system for the accounting of nuclear materials. In 1991-92 Argentina and Brazil disavowed the use of peaceful nuclear explosions, began working with the IAEA to allow international inspections, and established the Argentine-Brazilian Accounting and Control Commission (ABACC) which set-up bilateral safeguard measures that were more thorough than the IAEA standards. These bilateral safeguards "...and verification of inventories proved to be a major confidence building measure." Finally, in 1994, Argentina ratified the Treaty of Tlateloco and in the following year the NPT, completing all the key formalities of non-nuclear status.

**ARGENTINA'S DECISION**

Argentina's decision to abandon its nuclear weapons programs has everything to do with its security considerations---specifically, its changing views on what security for the country looked like and how to obtain it. The pursuit of nuclear weapons by Argentina can only be understood in the context of its long standing regional rivalry with Brazil. In the mid-twentieth century there was significant concern about Brazil's growing population, economy, and international recognition as the leading power in South America. Argentina wanted military parity with Brazil and to prevent any encircling politico-military alliance between Brazil and Chile. A nuclear deterrent seemed a simple way to achieve these security goals.

In 1979 Argentinean perceptions of the security environment began shifting when Argentina, Paraguay, and Brazil signed a tripartite agreement regarding the Itaipu Dam that was being built along the Brazil-Paraguay border. Argentina was concerned that, in the event of a

---

conflict, Brazil could open the floodgates, which would raise the water level and flood Buenos Aires. The agreement resolved this concern and was quickly followed by a successful visit from the Brazilian president in 1980 when the bilateral nuclear cooperation agreement was signed.

The loss to the British in the Falklands War in 1982 also served to alter Argentina's regional security perceptions. For one, it delegitimized the military dictatorship in power at the time and was a leading factor in bringing Alfonsin to power. Having been in a war with a nuclear power may have caused the desire for nuclear weapons to serve as a deterrent to grow. However, the defeat instead caused a more long-term reassessment of both international as well as regional threats and made cooperation with Brazil look even more appealing. The conclusion of the Beagle Channel dispute with Chile in 1984 helped further ease the sense of encirclement that Argentina feared. Rivalries were not eliminated, but tensions were reduced over time through a serious of bilateral confidence building measures between Argentina and Brazil.

These measures were accelerated in 1983 when Alfonsin took office. The domestic political constituencies that gave rise to the Alfonsin regime likely motivated him to readily embrace liberalizing economic and integrationist policies. With the nuclear weapons programs seen as roadblocks to deeper cooperation with Brazil, it should come as no surprise that Alfonsin and then Menem should abandon them. It is important to note however, the notion that the security of all countries in South America could be increased through regional cooperation did not begin with the civilian regimes. As Solingen points out, the "military dictatorships in Brazil and Argentina [had already] set in motion bilateral nuclear cooperation in 1980." It is not clear that the reduction in regional tensions that was occurring would not have eventually led a military regime to embrace the abandonment of the nuclear weapons program. Furthermore, it is

---

47 Ibid, 32.
difficult to see how abandonment would have been as popular or easy without an already improved and improving security environment.

It is difficult to see how one could conclude that the NPT had anything to do with Argentinean nuclear decision-making. Argentina's original refusal to have anything to do with the non-proliferation regime was because "of its discriminatory nature and alleged negative impact on their independent nuclear energy program." Further, the entire process of rapprochement through nuclear energy cooperation with Brazil was accomplished bilaterally---"the involvement of the IAEA and other multilateral non-proliferation agencies was not noticeable in this process." It was only long after it had cancelled its nuclear weapons programs at the conclusion of this more-than-decade-long process of cooperation that Argentina even signed the NPT in 1995.

BRAZIL

NUCLEAR PROGRAM HISTORY

The history of Brazil's nuclear program is intertwined with and inseparable from that of Argentina. Like Argentina, Brazil is a country rich in natural nuclear resources with an estimated uranium reserve of 300,000 tons and a thorium reserve of 80,000 tons. The first several decades of Brazil's nuclear program development were also characterized by a strategic ambiguity regarding its intention to develop nuclear weapons and a desire eventually to have an independent nuclear capability without relying on foreign assistance. However, due to "vagaries of domestic politics," a heavily state-managed approach, and a lack of consensus and continuity, Brazil today operates only two nuclear reactors that generate power---Angra I and Angra II---

49 Paul, Power, 99.
50 Ibid, 102.
located at one power plant in Rio de Janeiro.\textsuperscript{52} At the same time, it does possess an impressive array of facilities that cover the entire nuclear fuel cycle. Brazil is a leader in international non-proliferation efforts and a signatory to the Treaty of Tlateloco and the NPT.

Brazil initiated its research into nuclear technology as early as 1945 when it signed a nuclear cooperation agreement with the United States. This cooperation consisted mostly of research into nuclear energy facilities and exploration for uranium and thorium. By 1955 Brazil had created its own National Nuclear Energy Commission (CNEN) and continued to pursue nuclear cooperation agreements with the United States, through which it acquired its first research reactor in 1957. The early 1960s were consumed with an abortive attempt at nuclear agreements with France before the Brazilians returned to the table with the United States and commissioned their first power plant from Westinghouse in 1971. When the United States' non-proliferation posture hardened as a result of the Indian nuclear explosion in 1974, Brazil needed to ensure a continuing supply of enriched uranium for its new reactor and so negotiated a comprehensive nuclear deal with West Germany that included full fuel cycle technology and up to 10 nuclear reactors.\textsuperscript{53} However, fifteen years of cooperation with the West Germans did little for the Brazilian civil nuclear sector; Brazil gained only one unfinished reactor and technology for an unsuccessful uranium enrichment program.

When Brazil's military developed an interest in sensitive nuclear technologies, it launched its own parallel program. This interest was evident as early as 1953 when Admiral Alvaro Alberto, director of the National Research Council, attempted to purchase three experimental ultra-centrifuges for uranium enrichment from West Germany.\textsuperscript{54} Interest was maintained, but increased dramatically with the establishment of military rule in 1964 and by

\textsuperscript{52} Paul, \textit{Power}, 107.
\textsuperscript{53} Cirincione, et al, \textit{Deadly Arsenals}, 396.
\textsuperscript{54} This sale was eventually blocked by the United States. Solingen, "Political Economy," 159.
1967, the National Security Council declared nuclear capabilities as one of the key tenets of Brazilian national security doctrine.\textsuperscript{55} It was at this time that Brazil, like Argentina, flatly rejected the NPT as well as the Treaty of Tlateloco.

It was not until 1975, during the presidency of General Ernesto Geisel, that the military officially launched an independent, clandestine nuclear development program. This effort occurred in conjunction with continued improvements in potential delivery systems with an already strong aircraft industry and advancements in Brazilian missile technology. All three branches of the military pursued different methods to develop weapons-grade fissile material---the army chose graphite reactors for producing plutonium, the navy chose ultra-centrifuges for uranium enrichment, and the air force chose laser-enrichment of uranium. The programs launched allegedly included research on weapons design and the air force actually built a 300-meter-deep shaft for testing nuclear explosions at Cachimbo in the Amazon jungle.\textsuperscript{56} Only the navy successfully enriched uranium, although not enough to produce a nuclear weapon.

These military programs continued throughout the 1980s, but several factors, such as the tightening of resources due to the economic problems in Latin America as a whole, contributed to the slowing of both the military and civilian and nuclear programs. It was also clear that Brazilian leadership had begun rethinking its nuclear posture. The election of the civilian government of President Jose Sarney in 1985 came with substantial nuclear policy changes, including a restructuring of the CNEN. Most importantly, however, Sarney was able to work with Alfonsin in Argentina to further bilateral cooperation and rapprochement beginning with the 1985 Foz do Iguazu Declaration. While the military remained in full control of its parallel nuclear program, its facilities were included in the reciprocal visits that were negotiated---as

\textsuperscript{56} Cirincione, et al, \textit{Deadly Arsenals}, 396.
evidenced by Alfonsin's visit to the Brazilian Navy's Aramar ultracentrifuge enrichment plant in April 1988.\textsuperscript{57} As suggested above, these visits no doubt had a major impact on building confidence between the two states and allowed the rapid succession of their bilateral non-proliferation accords.

In 1988 a provision was included in the Brazilian constitution that nuclear energy was to be used only for peaceful purposes. Following the election of President Fernando Collor de Mello in 1990, the Brazilian military produced a report on its various nuclear programs. After subsequent review, the president met with the chiefs of the army, navy, and air force and asked them to end their programs, closed the Cachimbo test site, and became the first Brazilian president to renounce all nuclear explosions, including peaceful ones.\textsuperscript{58} With the new IAEA and ABACC safeguard regimes in place, Brazil followed the lead of Argentina and embraced the concept of a NWFZ in Latin America and acceded to the Treaty of Tlateloco. Finally, in 1998, Brazil signed and ratified the NPT.

\textit{BRAZIL'S DECISION}

Brazil's decision first to pursue and then to abandon its nuclear weapons program is similar to that of Argentina. A realist might ask, if the Brazilians did not have any serious military competitors, why would they pursue nuclear weapons? Put simply, the Brazilian program grew out of the potential threat presented by the rivalry between the two states. While Brazil did enjoy conventional military superiority over the other states in South America, acquisition of a nuclear arsenal by Argentina would completely change that dynamic. In the 1950s and 1960s particularly, Brazil was concerned both about Argentina freezing it out of the

\textsuperscript{57} Barletta, "Military," p. 22.
\textsuperscript{58} David Albright, "Brazil Comes in From the Cold," \textit{Arms Control Today} 20 (1990): 13.
leadership role in South America by developing strategic relationships with surrounding
countries, and its relative advantage in nuclear development. \(^{59}\) Because of the mutual distrust
between the countries, every new nuclear development was assumed to be Argentina exploring
the nuclear option more seriously. \(^{60}\) However, as noted above, the easing of tensions over the
Itaipu Dam made the value of regional cooperation more apparent, and efforts to expand political
and economic relationships were made. As bilateral nuclear cooperation and confidence-
building measures were conducted and Brazil had more reason to feel comfortable about
Argentina's nuclear program, it had less reason to develop its own—a nuclear arms race would
do nothing but harm Brazil's security environment.

The type of governmental regime did have some influence over Brazil's nuclear decision-
making. The changes that the civilian government made to nuclear policy when it came to
power it were seen as significant. However, even when Jose Sarney came to power in 1985 and
eschewed nuclear weapons and later helped pass a constitutional amendment mandating that
nuclear energy was only to be used for peaceful purposes, the military continued to operate its
parallel programs. It was not until Collor came to power that these programs were actually
terminated. Again however, the beginnings of rapprochement had begun under a military
dictatorship and the improved security environment diminished the felt need for a nuclear
weapons program, no matter the type of government.

As in the case of Argentina, the NPT appears to have had no effect on Brazil's nuclear
decision-making. Brazil claimed the non-proliferation regime was discriminatory and felt as
though it "would have frozen the global power structure and closed off Brazil's chances to

\(^{60}\) Myers, "Brazil," 60.
become a major power.”⁶¹ Eventually however, Brazil did sign and ratify the NPT following the bilateral rapprochement process. Paul encapsulates the reasons for the Brazilian (and Argentinean) non-nuclear weapon policies that arose from a cost-benefit calculation by leaders "who came to view nuclear acquisition, even maintenance of a weapons option, as hampering their economic and security cooperation and as leading to a technological race with military [and therefore security] implications.”⁶²

LIBYA

NUCLEAR PROGRAM HISTORY

After over three decades of persistently trying to acquire nuclear weapons, Libya announced in December of 2003 that it was abandoning its nuclear weapons programs. Although clearly interested in eventually developing an independent manufacturing capability, Libya focused in the short-term on using its vast oil wealth to purchase a weapon outright or to import what it needed to acquire and weaponize fissile material. The state's focus on importation and weaponization, however, led to weak development of its nuclear infrastructure. Today, Libya's major nuclear facilities include only a 10-megawatt light-water research reactor and a 100-watt critical assembly.⁶³ In recent years, in recognition of its decision to eschew nuclear weapons and cooperate with the IAEA safeguards, Libya has concluded nuclear cooperation agreements with France, Russia, Ukraine, Argentina, and Canada.⁶⁴ In should be noted however, the recent turmoil leaves the country's nuclear future unclear.

---

⁶² Ibid, 100.
In 1968, Libyan King Idris al-Sanusi signed the NPT. There was no indication that Libya had a serious interest in developing a nuclear program until Colonel Muammar Qadhafi came to power the following year. Almost immediately, Qadhafi made clear his desire to acquire nuclear weapons. Although his offers were rejected, in 1970 he sent his second-in-command to China repeatedly to attempt to buy a nuclear weapon outright.\textsuperscript{65} In the early 1970s, Libya began secretly purchasing uranium yellowcake from a French-controlled mine in nearby Niger. Offering these nuclear materials and significant financing, Libya turned to Pakistan and attempted to co-opt its nuclear program hoping to share in its results.\textsuperscript{66} At the same time Qadhafi ratified the NPT in 1975, demonstrating that "membership did not preclude blatant violations."\textsuperscript{67} Ratification was the price that Qadhafi had to pay to finalize a nuclear cooperation agreement with the Soviet Union in order to acquire a 10-megawatt research reactor at Tajoura, which began operating in 1979.

Through most of the 1980s and 1990s the Libyan nuclear program appeared to suffer from mismanagement and, due to international sanctions, foreign reluctance to supply the state with necessary materials and knowledge. Although the Soviet Union planned to build a power reactor at Sitre in the early 1980s, it eventually lost interest in the plan and abandoned it. The Libyans only had the small reactor at Tajoura and it was not until the late 1990s when Russia reopened nuclear cooperation talks that they returned to serious discussions about acquiring additional power reactors. In 1995, Qadhafi supported the indefinite extension of the NPT and in 1996 he signed (and later ratified) the Pelindaba African-Nuclear-Weapons-Free-Zone Treaty. In a further attempt to end its international isolation, Libya turned over two intelligence officials

\textsuperscript{66} It is not clear whether Libya ever received anything from this arrangement, but some have suggested the technology it later acquired from Pakistan may have been a payment. Timmerman, \textit{Weapons}, 88.
\textsuperscript{67} Solingen, \textit{Nuclear Logics}, 217.
believed to be involved in the 1988 Pan Am Flight 103 bombing which led to the suspension of U.N. sanctions (although not U.S. sanctions) in 1999. Prior to Qadhafi's renunciation of his nuclear weapons programs, many pointed to the sanctions regime as the tool that had forestalled Libyan nuclear efforts and pushed him toward international cooperation.  

With the disclosure and IAEA inspections in 2003, it was clear that Qadhafi's focus remained on foreign-supplied nuclear weapons development---the Libyans had begun clandestine research into gas-centrifuge uranium enrichment in the early 1980s. When inspectors were given access to nuclear sites, what they found exceeded their expectations:

   even as Libya intensified its efforts to move close to the West, it had from the mid-1990s been undertaking serious—and unusually successful—efforts to acquire nuclear technology. According to a senior U.S. official, procurement accelerated after the suspension of United Nations sanctions in 1999.

Libyan importation was indeed impressive: the total amount of uranium imported was 1,587 metric tons in 6,367 drums; 20 assembled L-1 centrifuges with components for 200 more; 2 additional advanced L-2 centrifuges (able to spin at much faster speeds) with orders for 10,000 more; and reams of documents related to design and fabrication of a nuclear explosive device.

Despite all this foreign assistance, however, Libya managed to assemble only a 9 centrifuge enrichment cascade and had taken no steps toward weaponization.

Days before the 2003 invasion of Iraq took place, the chief of Libyan intelligence Musa Kussa contacted MI6 British intelligence officials in Tripoli seeking to successfully resolve negotiations that began during the Clinton administration for an end to Libya's unconventional weapons program in exchange for a normalization of relations. The pace of these negotiations picked up following the interception of a German cargo ship carrying centrifuge parts traveling

---


69 Stephen Fidler, Mark Huband, and Roula Khalaf, "Return to the Fold: How Gadaffi was persuaded to give up his nuclear goals," The Financial Times, January 27, 2004.

70 Cirincione, et al, Deadly Arsenals, 322-323.
from Dubai to Libya. It is not clear as to whether this seizure convinced Qadhafi that his actions
could not escape detection or if the Libyans tipped-off the Americans and the British as a gesture
of good faith.\footnote{Fidler, et al, "Gadaffi."} Regardless, following preliminary inspections of its previously undisclosed
nuclear sites, Libya announced on December 19, 2003 that, under international supervision, it
would halt its unconventional weapons programs and eliminate any weapons stockpiles. By
January, Libya had signed the Chemical Weapons Convention and ratified the Comprehensive
Test Ban Treaty as a sign of its desire to engage internationally. Although rapprochement
between Libya and the United States had begun slowly, the current violence happening there
makes the future unclear.

\textit{LIBYA'S DECISION}

It is easy to assume that the Libyan case can be explained simply by an appeal to the
idiosyncratic character of Muammar Qadhafi. To be sure, the autocratic nature of his regime
ensured his vision would have a serious impact on nuclear decision-making. Furthermore, the
apparent discontinuity between al-Sanusi's and Qadhafi's desire for nuclear weapons within the
same timeframe suggests that there was not a clear existential threat to Libya. However, in the
1970s, Qadhafi had either adversarial relationships or engaged in armed conflict with many of
his neighbors (mostly through his own provocation), and it is likely he believed with a nuclear
weapon he would be afforded more freedom of action to do what he pleased in the international
arena.\footnote{Solingen, \textit{Nuclear Logics}, 214.} Additionally, it is likely he believed the most important freedom was freedom from
interference by the western powers.
Libya's 2003 decision to abandon its three decade-long quest for nuclear weapons capability came about (just as in the other three cases) by a reevaluation of the relative utility of acquiring such weapons. When asked why he had decided to give up the nuclear weapons program in a 2005 interview with Time magazine, Qadhafi explained his changed thinking:

By manufacturing nuclear weapons, against whom are we going to use them? World alliances have changed. We had no target. And then we started thinking about the cost. If someone attacks you and you use a nuclear bomb, you are in effect using it against yourself.  

He is here making the point that the benefits of nuclear weapons are not as clear as they (apparently) used to be. However, surely these considerations did not take 30 years to come to the fore. Nor is it likely that they would have emerged seemingly overnight---Libya was frantically acquiring components for its nuclear program throughout the disarmament negotiations both during the Clinton years and the run-up to the 2003 Iraq War (this duplicity also suggests that a decision to abandon was far from made during the majority of the negotiations). Far more likely, Qadhafi saw a real, external security threat from the United States in the acquisition of nuclear weapons---according to "Arabs who were in regular conversations with Libyan officials...the regime was increasingly desperate to secure a deal as the war in Iraq loomed, worried that 'it would be next' in some unspecified way." With this security concern and the supply-side difficulty he had in obtaining nuclear weapons, Qadhafi surely had a different decision-making calculus than when he first launched his program.

Qadhafi was in power throughout both the periods of pursuit and abandonment of Libya's nuclear weapons program, so it is difficult to argue that either the individual or the type of regime were significant determinants of its decisions. Regime survival was definitely a concern for Qadhafi, from either external or internal threats. However, had the domestic political and

---

74 Fidler, et al, "Gaddafi."
economic situation been so bad, as Solingen suggests, he did have 30 years of experience in political survival with abundant personal resources to assuage his population and no compunction about ruthlessly suppressing them. Finally, it seems clear that the NPT had nothing to do with the Libyan case. Although his government ratified the treaty in 1975, Qadhafi repeatedly flouted the non-proliferation regime every chance that he could. In the Libyan case as well then, external security concerns---in this case concerns over action by an anti-nuclear proliferation hegemon---appear the dominant driver in its decision to abandon its nuclear weapons program.

**IMPORTANCE OF SECURITY**

The presence of a regional existential threat for South Korea did not cause it to acquire an independent nuclear weapons capability. Although a regional and ideological foe in Israel had nuclear weapons, Libya abandoned its program. Argentina and Brazil began a long process of rapprochement and nuclear cooperation under military dictatorships that at one point believed nuclear weapons were necessary. In each case, decisions to either acquire or abandon the quest to acquire nuclear weapons, show a complex interplay of many different factors from all three of Sagan’s categories of motivations---no one theory or explanation explains everything about all nuclear decisions in all cases. It is important to remain aware of the fundamental insight that theories simply provide frameworks through which one can understand international relations phenomena. There are no simple or one-size-fits-all answers in understanding proliferation.

Given the complexity and challenges presented, what can be said about why states choose to proliferate? Everything about the four cases considered in this paper---and all other proliferation cases---suggests that a state’s decision about whether to go nuclear is based on a complex cost-benefit analysis. Two things seem clear: (1) the state must believe that acquiring
nuclear weapons is in its best interests (however perceived); and (2) the perceived utility that the state hopes to gain must outweigh the costs. From here it becomes more complex, but not impossible to assess the relative importance of the driving forces of nuclear-decision-making. The results of the research suggest two main conclusions: (1) that maximizing the security of the state is the fundamental driver in nuclear decision-making; and (2) security can be achieved in a variety of ways (including non-nuclear).

Both Paul and Solingen criticize the strict realist school of proliferation for predicting, as Paul puts it, that states will seek to "[maximize] power through greater acquisition of arms." Whether or not that is the necessary conclusion of all realist thinkers, Paul at least recognizes realism's significant importance to nuclear proliferation: namely, that a state will act in its own interest to maximize its own security. He introduces the term "prudential realism" to describe the fact that "nations under certain circumstances may prudently forgo military capabilities that others find threatening" to increase their overall security. Prudential realism may or may not be a necessary contribution to the body of theory. It may be simpler to refine our understanding of the factors that legitimately play into the notion of security. Daniel Poneman recognized that nuclear technology can affect security in a variety of ways and has both positive and negative effects from a military standpoint. Nuclear weapons can deter a conventional or nuclear attack, but on the other hand, nuclear weapons programs might detract resources from other necessary weapons systems or invite preventive or preemptive attack. Calculations about increasing security are not cut and dry and economic considerations and regional political cooperation can be important factors.

75 Paul, Power, 5.
76 Ibid.
Security issues, with all of their complexities, play a predominant role in what drives the determination of a state's interests and therefore its nuclear acquisition calculus. Even Solingen seems to acknowledge the primacy of security concerns: "A state's structural context helps identify potential sources of nuclear postures, but does not account parsimoniously for the great variation encountered across countries and throughout time."\(^7^8\) This is absolutely true, but Solingen asks too much from her theories. Other factors are unmistakably present, but it seems they have more of an impact on the "how" rather than the "why" of nuclear proliferation and non-proliferation. Surely, as Levite notes, there is always going to be "acute demand facing virtually all nuclear programs for sustained, high-level domestic political support (to mobilize scarce resources, overcome bureaucratic and technical hurdles, and offset risks)."\(^7^9\) However, the need for a favorable political climate acts more as a restraint than a driver---one could imagine circumstances in which a leader, attempting to shore up nationalistic support, found ways other than nuclear weapons to do so. In the case of South Korea, Solingen's own arguments for the importance of domestic politics suggests that the confluence of security shocks and changing international events "embolden[ed] domestic forces favoring economic and military self-reliance (emphasis mine)."\(^8^0\) In this case the waning U.S. commitment and increasing South Korean threat perception is what caused these domestic constituencies either to take action to drive the state toward an independent nuclear program, or more likely, made their arguments sound more reasonable to the leaders. These other factors seem to accelerate and reinforce changes in the calculations concerning the utility of nuclear weapons. In other words,

\(^{7^8}\) Solingen, "Political Economy," 130.
\(^{7^9}\) Levite, "Never Say Never," 86.
\(^{8^0}\) Solingen, *Nuclear Logics*, 89.
they act as intervening variables that help shape the timing and precise nature of outcomes, but not as drivers.

CONCLUSION

Given what is known about the nuclear motivations of states, what does this suggest about the NPT? The NPT appears to have been largely irrelevant in dealing with the hard cases of proliferation. The special cases of late nuclear reversal studied in this paper—which the international community generally considers non-proliferation success stories—did not occur because of (indeed, with little or no involvement by) the NPT regime. The research conducted for this paper would suggest that if the non-proliferation regime is not having an impact on the nuclear decision-making of states, then that is because it does not adequately address the security-based concerns of many states. The NPT was in fact created specifically to address security issues—to provide a guarantee that its non-nuclear signatories would not pursue nuclear weapons so that other states would not have their security threatened by new nuclear powers. However, states such as Libya and North Korea have been able to flagrantly flout their commitments to the regime. In the case of Japan or Taiwan, the biggest potential threat is an already "legal" nuclear weapons state. For these and other reasons, states do not and cannot take the NPT regime seriously as a guarantor of their security.

All of this begs the question: why did countries like Argentina and Brazil bother to sign the NPT after they had abandoned their nuclear weapons programs? What was the point? The likely answer is that the international community asked them to do so. It was and is a cost-benefit analysis. As Solingen notes, in return for signing and participating in the NPT "a state can secure certain international economic, financial, or political benefits—such as debt relief,
export markets, technology transfer, food imports, aid, and investments.\textsuperscript{81} In many cases, the diplomatic capital that is obtained is worth the relatively small price of agreeing to not do what a state had already decided not to do.

The NPT also acts to constrain the supply of nuclear materials through the IAEA which provides a modicum of oversight of signatories' nuclear programs. This can also act as a confidence-building measure between states, although the number of regime cheaters limits this effect. Also, though the norms it has created do not constrain states with more powerful security-related impetuses, it has created an international atmosphere in which the "default" position of states is against proliferation.

This paper is not suggesting discarding the NPT regime or suggesting that it has not served any purpose in the history of nuclear non-proliferation. A good topic for further research may indeed be the period in the 1960s when the treaty was being negotiated. A closer look at countries such as Australia, Italy, and Sweden (which all briefly pursued nuclear weapons programs) and the NPT's influence in their eventual nuclear forbearance would be a valuable contribution to our understanding of non-proliferation. Another good topic might be an analysis of certain states' debates surrounding the decision to sign and ratify the NPT to see what drove participation in the regime at all.

Going forward if the United States desires to maintain nuclear non-proliferation as a major foreign policy goal it should not focus on preserving the NPT regime. Rather, the U.S. should focus on shaping the security environment of problem states in any way it can. This may include providing incentives and disincentives that focus on security---in the case of Iran, perhaps offering limited security guarantees such as a commitment not to use nuclear weapons in

\textsuperscript{81} Solingen, "Political Economy," 139.
a conflict and a commitment to respect Iran's political sovereignty. Of course, it will be important to ensure that any inducements reward good non-proliferation behavior and that those rewards be cut off when the good behavior ceases. Also, none of this precludes addressing other factors that might also play a role in accelerating a non-nuclear posture, for example support for domestic constituencies that support nuclear non-proliferation. It will be through these direct negotiations and actions, and not through the NPT regime, that non-proliferation efforts will be successful in the future.
BIBLIOGRAPHY


