

A DIVERGENCE IN THE PENINSULA:

WHY HAS NORTH KOREA DEVELOPED
NUCLEAR WEAPONS, YET SOUTH KOREA
HAS REFRAINED?

PREDICTING IRAN'S NUCLEAR FUTURE
USING A COMPARATIVE CASE STUDY

KATHLEEN HEVERIN

This paper analyzes the conditions under which states develop nuclear weapons. North and South Korea present cases of similarly situated states going in opposite directions concerning nuclear weapons development. By analyzing the climactic moments in North and South Korean history of nuclear weapons development, I have determined that states need two necessary conditions to develop nuclear weapons: motivation and means. States are motivated by a security concern. When this is coupled with means in the form of state capability, either from sufficient domestic economic advancement or foreign aid, nuclear weapons development occurs. This issue has modern policy implications in security and regional stability. In the case of Iran, nuclear weapons development is likely, as both conditions of security concern, and state capability are present. Identifying these conditions can help determine how to shape policies to prevent nuclear proliferation and restrict a regime that is widely considered unstable from gaining this type of potential for destruction.

I. Introduction

After the defeat of Japan in World War II, the United States and the Soviet Union drew a line across the Korean Peninsula. North of the 38th parallel, the Soviet Union established the Democratic People's Republic of Korea (DPRK), a communist government under Kim Il-Sung. In contrast to the Soviet-established communist government in the North, the United States established the Republic of Korea (ROK) as the governing system in the South, led by President Syngman Rhee.¹ As these once unified nations developed, they diverged on all fronts, ranging from regime type to economic systems.² I will investigate another key difference that has emerged in these two states, asking: "Why has North Korea developed nuclear weapons since gaining statehood, yet South Korea has not?"

Investigating the factors that allowed North Korea to develop nuclear weapons and South Korea to ultimately abstain from development efforts will give insight into Iran's nuclear weapons development. Iran has agreed to several treaties prohibiting their development, including the Nuclear Non-Proliferation Treaty (NPT), and the Joint Comprehensive Plan of Action (JCPOA). However, it is suspected that Iran is not fully abiding by these commitments, and its recent rapid acquisition of highly enriched uranium has sparked concern of a breakthrough, potentially serving as a catalyst for the United States' recent attacks on Iranian nuclear facilities.³ There are significant similarities between pre-nuclear North Korea and present-day Iran, notably the commitment to treaties limiting nuclear development and

¹ Sarah Pruitt, "Why Are North and South Korea Divided?," History.com, February 9, 2018, <https://www.history.com/articles/north-south-korea-divided-reasons-facts>.

² John West, "Poverty and Prosperity in North and South Korea," *Asian Century Institute*, June 8, 2014, <https://asiancenturyinstitute.com/development/650-poverty-and-prosperity-in-north-and-south-korea#:~:text=In%20the%20terms%20of%20Acemoglu%20and%20Robinson%2C%20South%20Korea%20had,of%20their%20talents%20and%20skills>.

³ Claire Mills. "What Is the Status of Iran's Nuclear Programme and the JCPOA?" *UK Parliament*, October 4, 2024. <https://commonslibrary.parliament.uk/research-briefings/cbp-9870/>; Kari A. Bingen and Clayton Swope, "Why the United States Acted Now Against Iran," CSIS, June 25, 2025, <https://www.csis.org/analysis/why-united-states-acted-now-against-iran>.

subsequent failure to abide by those treaties, resulting in a tense relationship with the United States. Exploring which factors in the case of North Korea were most influential in encouraging the development of nuclear weapons as well as which factors in South Korea discouraged it are relevant to current foreign policy surrounding Iran's nuclear plans.

Establishing a theory on what causes the development of nuclear weapons is essential to understanding which non-proliferation efforts will be most effective in the modern international climate. Therefore, I will investigate the conditions under which states develop nuclear weapons. A state that is "developing nuclear weapons" is one that has either expressed intent or taken action to enrich uranium or separate plutonium beyond the level needed for benign purposes. A state that has "developed nuclear weapons" is one that has successfully launched a test of any bomb or missile that uses a nuclear reaction for destruction.

I will begin by outlining two theories of conditions under which states develop nuclear weapons, exploring the impacts of state capability and security. Then, I will conduct a comparative case study of post-independence North and South Korea to explore the pertinence of these two conditions in the development of nuclear arms in North Korea, and the lack of a nuclear weapons program in South Korea. Studying these cases supports the conclusion that there are two necessary conditions for nuclear weapons development: motivation and means. Using this theory, I will predict the development of an Iranian nuclear weapons program in the near future and propose general policy aims to prevent this outcome.

II. Implications of State Capability and Security on Nuclear Weapons Development

I will explore two arguments explaining states' development of nuclear weapons, with one emphasizing economic capability, and the other emphasizing security motivations. While neither of these arguments alone provides sufficient conditions for nuclear weapons

development, the most favorable conditions occur when an economically capable state is motivated by a security threat.

a. State Economic Capabilities

The first fundamental argument about the conditions under which states develop nuclear weapons is that states with more economic capabilities are more likely to pursue development of nuclear weapons.⁴ Economic capabilities are measured by a country's gross national income (GNI) per capita in alignment with the World Bank's World Development Report (WDR), which classifies thresholds for low, middle, and high income countries.⁵ While GNI per capita does not directly correlate to the level of funds allocated to a state's nuclear weapons program, high, and to a lesser extent middle income states have a greater capacity to absorb the high costs of nuclear weapons development than low income states.

Developing nuclear weapons is a highly technical process that requires vast resources, knowledge, and funding. There are two paths to acquiring a nuclear weapon, as outlined in Figure 1 below. States need either weapons-grade highly enriched uranium (HEU) or irradiated plutonium. The largest challenge in uranium enrichment is in developing the technology to enrich in the first place, but once a breakthrough is made, the process to achieve HEU can accelerate. The other path to the acquisition of nuclear weaponry is the use of plutonium.⁶

Plutonium can be obtained through irradiating uranium in a nuclear reactor. In a highly difficult

⁴ Sico van der Meer, "States' Motivations to Acquire or Forgo Nuclear Weapons: Four Factors of Influence," *Journal of Military and Strategic Studies*, (2016) https://www.clingendael.org/sites/default/files/2018-02/States%E2%80%99_Motivations_to_Acquire_or_Forgo_Nuclear_Weapons%20_August_2016.pdf, 211-214.

⁵ Divyanshi Wadhwa and Espen Prydz, "Classifying Countries by Income," *The World Bank*, September 9, 2019, <https://datatopics.worldbank.org/world-development-indicators/stories/the-classification-of-countries-by-income.html>.

⁶ "How Do Countries Create Nuclear Weapons?," *Council on Foreign Relations*, July 27, 2023, <https://education.cfr.org/learn/reading/how-do-countries-create-nuclear-weapons>.

and complex process, usable plutonium is then separated from the spent fuel leftover.⁷ In practice, these processes of either uranium enrichment or plutonium separation require the government to devote extensive funding to a nuclear program.

Figure 1: Paths to the Bomb⁸



If a state does not have the indigenous capability to develop nuclear weapons, capability can be provided by other states. Countries with more developed economies and research investment—or nuclear aid from another state—are more capable, and therefore more likely to develop nuclear weapons. Some scholars argue that this is possible for any government, and capability is irrelevant because it only reflects the willingness to divert funds from other programs rather than the inherent ability to develop nuclear weapons altogether.⁹ However, in some cases, it is not in a government's interest to divert funds from other programs to nuclear weapons development, as the funds required are so extensive that the reallocation would create significant backlash and threaten the legitimacy of the government itself. Therefore, there exists a level of economic and technological capability under which a government is unlikely to

⁷ "Fissile Materials Basics," *Union of Concerned Scientists*, July 18, 2009, <https://www.ucs.org/resources/fissile-materials-basics>.

⁸ "How Do Countries Create Nuclear Weapons?"

⁹ Sico van der Meer, "States' Motivations to Acquire or Forgo Nuclear Weapons: Four Factors of Influence," 214.

develop nuclear weapons. It is, at the same time, clear that development of nuclear weapons is not directly proportional to a country's GNI. There are wealthy countries with the economic capability to produce nuclear weapons who choose not to, including Japan, Germany, and Australia, proving that capability cannot be the sole necessary condition for nuclear weapons development.¹⁰

b. State Security

There are several factors beyond capability that influence development of a nuclear arsenal. State security is widely regarded as a major factor. Nuclear weapons have not been used for harmful purposes since 1945, when the United States bombed Japan to ensure its defeat in WWII. In an age where nuclear weapons are never used, the advantage to obtaining nuclear weapons is not to destroy an opponent, but to provide defense in the form of deterrence. Using a nuclear weapon against a second-strike capable state essentially ensures self destruction, making gaining second strike capabilities valuable to discouraging a nuclear attack. A state that has "second-strike capability" is one that can withstand a nuclear attack from another state, then launch their own in retaliation. Scott Sagan discusses security motivations as one of his three models of why states develop nuclear arms. His "security model" suggests that states will seek to develop nuclear weapons when they are "falling behind" in terms of relative strength in the international system.¹¹ The development of nuclear weapons leaves all states without second-strike capabilities comparatively vulnerable. Sagan's other hypothesis under the security model is that states develop nuclear weapons when faced with a security threat. Sharing a border

¹⁰ Peter Dizikes, "A Look at How Countries Go Nuclear - and Why Some Do Not," *MIT News*, (January 11, 2022): <https://news.mit.edu/2022/how-countries-go-nuclear-and-why-some-do-not-0111#:~:text=And%20many%20wealthy%20countries%2C%20including,not%20to%20pursue%20weapons%20programs>.

¹¹ Scott Sagan, "Why Do States Build Nuclear Weapons?," *International Security* 21 (February 18, 2011): 232–39, <https://doi.org/10.4324/9780203422144-37>, 57.

with an enemy state or having an enemy with nuclear power makes a state more likely to develop nuclear weapons.

Within the broader security argument, there also exists the argument that the fewer nuclear equipped allies a state has, the more likely it will be to develop nuclear weapons itself.¹² For the state to feel secure enough in their alliance to forgo nuclear weapons, it must believe it has collective security under extended deterrence. Collective security means that an ally of the state is willing to respond to an attack on the state with nuclear force against the aggressor. When an aggressor state believes that a nuclear power will retaliate on behalf of its ally, the deterrent effect of mutually assured destruction extends to that ally. Ultimately the conditions under which a state would develop nuclear weapons in the security model are a perceived lack of relative power in the international system due either to shortcomings in its own security or to a lack of credible extended deterrence from nuclear allies.

c. Measuring Arguments in a Comparative Case Study

Ultimately, motivation, provided by security concerns, and means, given by capability, are the conditions that cause a state to develop nuclear weapons. This conclusion is supported by evidence of nuclear weapons development existing only when both of these factors are present, and lack of development when one or both of these conditions are missing.

The cases of North and South Korea after the 1950s present interesting considerations for these two theories. The capabilities argument alone would predict that South Korea would have been more likely to develop nuclear weapons after its economy rose above the threshold of “low income” in the 1980s.¹³ The security argument would predict that North Korea would have been more likely to develop nuclear weapons when its relationship with its largest threats, the United

¹² Scott Sagan, “Why Do States Build Nuclear Weapons?,” 57.

¹³ Sungchul Chung, “Excelsior: The Korean Innovation Story,” *Issues in Science and Technology*, 2007, <https://issues.org/chung/>.

States and South Korea, were least cooperative. I will investigate the accuracy of these theories through a focus on pivotal moments in North and South Korean nuclear history.

III. A Comparative Case Study: What Made North Korea Nuclear?

In order to investigate the motivations for developing nuclear weapons, I will examine the cases of nuclear North Korea, and non-nuclear South Korea, from their independence in the 1950s to present-day.

After the Russo-Japanese War, Korea was overtaken as a Japanese colony.¹⁴ Following their divide, the tension between the military government in South Korea and the communist regime in North Korea culminated in the destructive Korean War, quickly involving UN forces on behalf of South Korea, as well as Chinese and Russian forces opposing the UN. After many deadly battles that resulted in two million North and South Korean civilian casualties, an armistice in 1953 ended the violence. However, this same agreement cemented a division between the North and the South, leading them down very different paths.¹⁵

These cases present a strong contrast due to the two countries' long shared history, similar cultural makeup, and near identical geographic positioning, making it easier to isolate where they differ. Additionally, North Korea is a valuable case study in that it experiences complex security considerations due to alliances with large nuclear powers of Russia and China, but tense relations with the nuclear United States.

North Korea is also valuable in predicting Iran's nuclear future as they share characteristics that contribute to their international designation as "rogue states." A rogue state is a state that defies the norms and threatens the stability of the international system. North Korea has a history of totalitarian rule, state-sponsored terrorism, economic failure, and human rights

¹⁴ Sarah Pruitt, "Why Are North and South Korea Divided?"

¹⁵ "Korean War," National Army Museum, accessed May 11, 2025, <https://www.nam.ac.uk/explore/korean-war>.

violations that contribute to a negative view of both state legitimacy and state actions.¹⁶ Iran has engaged in many similar “rogue” behaviors, including kidnapping, sponsoring terrorist organizations, and supporting foreign revolutions.¹⁷ For these reasons, North Korean nuclear motivations may be able to provide insight into Iranian intentions concerning nuclear weapons.

The case of South Korea allows for exploration of similar elements, including capability and security. It is somewhat paradoxical that South Korea, despite having greater capability to develop nuclear weapons, refrained from using it. South Korea is also faced with the large and often unpredictable security threat of North Korea, bringing into question why this security motivation has not translated into nuclear arms development.

a. Post-independence North Korea

The origins of a North Korean nuclear program began in 1952, when President Kim Il Sung established the Atomic Energy Research Institute and the Academy of Sciences. This initial program was heavily supported by the Soviet Union, giving North Korea the necessary scientific knowledge and resources.¹⁸ Scientists were sent from North Korea to the Soviet Union to be trained in nuclear energy in the mid-1950s. Most importantly, the Soviet Union aided North Koreans in building a nuclear reactor, which is necessary to produce plutonium.¹⁹ This supports the argument that a state with more capability will be more likely to pursue nuclear weapons development.

In the post-independence 1950s, “[t]he greatest threat, in the view of both Koreas, was that each might remain weak and underdeveloped and fail to secure the future of the Korean

¹⁶ Kirk Spitzer, “5 Reasons North Korea Is a ‘Rogue Regime,’” USA Today, January 6, 2016, <https://www.usatoday.com/story/news/world/2016/01/06/5-ways-north-korea-rogue-regime/78349910/>.

¹⁷ Barry Rubin, “US Foreign Policy and Rogue States,” *Middle East Review of International Affairs*, (September 1999): https://ciaotest.cc.columbia.edu/olj/meria/meria99_rub02.html.

¹⁸ North Korea and the NPT, accessed May 11, 2025, https://www.ipinst.org/wp-content/uploads/2010/04/pdfs_koreachapt2.pdf.

¹⁹ “North Korea’s Nuclear Program: A History,” *Korean Legal Studies*, accessed April 8, 2025.

nation against aggression from the other side and its patron.”²⁰ North Korea possessed weaker military strength than UN-backed South Korea during the Korean War, even when relying on the two powerful allies, the Soviet Union and China. This provides evidence that despite technological support from the Soviet Union, North Korea could not rely on its allies for defensive purposes, providing motivation to develop nuclear arms itself. Ultimately, in the 1950s, North Korea gained a capability to begin development of nuclear weapons from the Soviet Union, and it had a security motivation from losing the battle to become the stronger half of the Korean Peninsula.

North Korea continued to require foreign economic and technological support due to its low-income economy. In 1962, the Soviet Union cooperated with the United States during the Cuban Missile Crisis, which sparked doubt in North Korea about its positive relationship with the USSR.²¹ Aligning with the security theory of motivations for development, despite initial technological support, North Korea perceived the Cuban Missile Crisis as a shift in Soviet allegiance, questioning the support the Soviet Union could provide against a US threat. Two years later, North Korea requested China’s assistance with nuclear technology, however, China refused, representing yet another instance of a weakening of North Korean nuclear alliances that increased security concerns. Growing uncertainty around alliances led North Korea to have an increased motivation to develop nuclear weapons.²²

North Korea continued to require aid in developing nuclear power. However the Soviet Union would only continue to share technology if North Korea joined the NPT, which commits parties to stopping the development and spread of nuclear weapons. North Korea acceded to the

²⁰ Sheila Jasanoff and Sang-Hyun Kim, “Containing the Atom: Sociotechnical Imaginaries and Nuclear Power in the United States and South Korea,” *Minerva* 47, no. 2 (June 2009): 119–46, <https://doi.org/10.1007/s11024-009-9124-4>.

²¹ “North Korea’s Nuclear Program: A History.”

²² “North Korea’s Nuclear Program: A History.”

treaty in 1985. While this action may be viewed as a step back from nuclear weapons development, there is evidence that, despite joining this treaty, North Korea continued to make efforts to produce weapons-grade plutonium, and their ability was enhanced by Soviet technology.²³ Counterintuitively, signing the NPT gave North Korea greater capability to continue development of bomb fuel.

A condition of the NPT was that North Korea must allow inspections from the International Atomic Energy Agency (IAEA), however, North Korea raised suspicion by evading these inspections. The Soviet Union had been an influence in North Korea's decision to join the NPT in the first place.²⁴ By violating it, North Korea encountered an increased security risk of international attention to its nuclear program during an era of nonproliferation, in turn, alienating the Soviet Union and increasing its need to develop nuclear weapons. In this way, the initial security motivator of South Korea, beginning after the Korean war, led to North Korea's development of nuclear weapons, which in itself created more security concerns on an international scale that further motivated nuclear weapons development.

In October of 1994, three months after Kim Jong Il took power in the DPRK following his father's death, the United States and North Korea signed the Agreed Framework.²⁵ This agreement froze North Korean nuclear weapons development in exchange for the United States providing two proliferation-resistant nuclear power reactors. It also stated that "both sides commit not to nuclearize the Korean Peninsula," and "the United States must 'provide formal assurances' not to threaten or use nuclear weapons against North Korea."²⁶ This agreement marked a turning point in North Korean nuclear advancement as it was now provided with

²³ "North Korea's Nuclear Program: A History."

²⁴ "North Korea's Nuclear Program: A History."

²⁵ "North Korea's Nuclear Program: A History."

²⁶ Kelsey Davenport, "The US-North Korean Agreed Framework at a Glance," Arms Control Association, accessed May 11, 2025, <https://www.armscontrol.org/factsheets/us-north-korean-agreed-framework-glance>.

assurance that the United States, its primary nuclear threat, would not launch a nuclear strike.

This guarantee removed the security motivation for developing nuclear weapons, which explains the lack of progress in the development of nuclear bomb fuel while the Agreed Framework was in effect.

A final pivotal moment in North Korean nuclear history is the resurgence of nuclear arms motivation that led to the detonation of a North Korean nuclear bomb. 2001 marked a major shift in North Korean-US relations when George W. Bush became the US President. In the aftermath of 9/11, Bush began publicly referring to North Korea as part of an “Axis of Evil,” also including Iran and Iraq in this description.²⁷ Additionally, despite no official indications that North Korea had violated the Agreed Framework, Bush put off negotiations with North Korea on the grounds that its compliance with the Agreed Framework could not be verified.²⁸ This created a concern of North Korean vulnerability as it was called into question whether the United States would uphold its assurance to not use force against North Korea, and North Korea was also painted as a state threatening global peace. In 2003, North Korea officially withdrew from the NPT. That same year, Pyongyang made its first admission to possessing nuclear weapons. Just three years later, North Korea conducted its first nuclear test, officially reaching the point of nuclear weapons development.²⁹

*Figure 2: North Korea Nuclear Program - Technical Focus*³⁰

²⁷ “North Korea’s Nuclear Program: A History.”

²⁸ Alex Wagner, “Bush Puts N. Korea Negotiations on Hold, Stresses Verification,” Arms Control Association, April 2001, accessed May 11, 2025,

<https://www.armscontrol.org/act/2001-04/press-releases/bush-puts-n-korea-negotiations-hold-stresses-verification>.

²⁹ “North Korea’s Nuclear Program: A History.”

³⁰ Elliot Serbin, Robert Carlin, and Siegfried Hecker, “A Comprehensive History of North Korea’s Nuclear Program and Lessons Learned,” (Stanford, CA *Center for International Security and Cooperation*: May 23, 2018), https://fsi9-prod.s3.us-west-1.amazonaws.com/s3fs-public/Korean_War1.pdf. Figure 2 provides a visual representation of the shift toward nuclear weapons development seen in the years following 2001. The green cells represent a shift away from nuclear development, and the red cells a shift toward, with the darker colors representing a more intense shift.

North Korea Nuclear Program– Technical Focus (Stanford University CISAC)
3 shades of green (dark best), 3 shades of red (dark worst) –Hecker/Carlin/Serbin

Year	US Diplomacy	DPRK Diplomacy	Yongbyon Presence	Plutonium	U enrich.	Tritium/Li-6 (H-bomb fuel)	Weaponize Design/build/test	Nukes (Summary)	Missiles	Imports	Exports
1992	G1	G1	G1	G2	G1	G1	R1	R1	R1	R1	R1
1993	G2	G2	G1	G2	G1	G1	R1	R1	R1	R1	R1
1994	G3	G3	G1	G2	G1	G1	R1	R1	R1	R1	R1
1995	G3	G3	G3	G3	G1	G1	R1	G3	R1	R1	R1
1996	G3	G3	G3	G3	G1	G1	R1	G3	R1	R1	R1
1997	G2	G2	G3	G3	R1	G1	R1	G3	R1	R2	R1
1998	G2	G2	G3	G3	R1	G1	R1	G3	R1	R2	R1
1999	G3	G3	G3	G3	R1	G1	R1	G3	G1	R2	R3
2000	G3	G3	G3	G3	R1	G1	R1	G3	G1	R2	R3
2001	R2	G2	G3	G3	R1	G1	R1	G3	G1	R2	R3
2002	R3	G2	G3	G3	R1	G1	R1	G3	G1	R2	R3
2003	R2	R2	R3	R3	R1	R1	R2	R2	G1	R2	R3
2004	R2	R1	R3	R3	R1	R1	R2	R2	G1	R2	R3
2005	R1	R1	R3	R3	R1	R1	R2	R2	R1	R2	R3
2006	R1	R2	R3	R3	R1	R1	R2	R2	R1	R2	R3
2007	G2	G1	G3	G1	R1	R1	R1	R1	R1	R1	R3
2008	G2	G1	G3	G1	R1	R1	R1	R1	R1	R1	R2
2009	R1	R1	R2	R1	R2	R2	R2	R2	R1	R2	R2
2010	G1	R1	R3	R1	R2	R2	R2	R2	R1	R2	R2
2011	G1	G1	R3	R1	R2	R2	R2	R2	R1	R2	R2
2012	R1	R1	R3	R1	R2	R2	R2	R2	R1	R2	R2
2013	R2	R1	R3	R2	R2	R2	R2	R2	R1	R2	R1
2014	R2	R1	R3	R2	R3	R3	R2	R2	R1	R2	R1
2015	R1	G1	R3	R3	R3	R3	R2	R2	R2	R2	R1
2016	R1	R3	R3	R3	R3	R3	R3	R3	R2	R2	R1
2017	R3	R3	R3	R3	R3	R3	R3	R3	R3	R2	R1

This shift—from a pause in plutonium production under the Agreed Framework to an outright effort to develop nuclear weapons beginning in 2001—is marked primarily by increased security concerns due to harsh US foreign policy beginning after 9/11. North Korea already had an established capability to develop nuclear bomb fuel acquired through foreign assistance beginning in the 1950s; however, it was the shift in political climate into one of increased uncertainty about US actions that provided the final motivation to see nuclear arms development through to success.

b. South Korea since 1950

There have been periods in South Korean history when it has attempted to develop a nuclear bomb before abandoning these efforts. Looking into these periods and the influences that

caused the state to ultimately abandon development efforts will be valuable in determining the relevance of each theory.

Initial interest in a nuclear weapons program in South Korea began in the 1950s. The atomic bomb became viewed as a valuable asset for many South Koreans due to its role both in defeating the Japanese, who had a long history of occupying Korea, and as a source of leverage used by the United States to deter China and North Korea during the Korean war.³¹ In 1959, South Korea established the Atomic Energy Research Institute, which, for official purposes, developed nuclear power, but, from public perception, worked towards the development of a nuclear bomb.

During this time, a serious nuclear weapons program in South Korea did not emerge, only a modest step towards nuclear energy aided by the United States. The motivation for acquiring nuclear weapons originated from the motivation of remaining more powerful than North Korea.³² In the aftermath of the Korean War, both states were vulnerable and economically devastated.³³ Their main concern was gaining relative power over their enemy. The Korean Armistice Agreement resulted in a ceasefire, but no formal end to the war. South Korea had received aid from UN forces during the war that helped them achieve a military advantage. In the aftermath of the armistice, the ROK viewed nuclear arms as a necessary step to gaining power over the DPRK. Despite security concerns that would have motivated the development of nuclear weapons, the lack of capability, due largely to post-war fragility, resulted in failure to yield

³¹ "Imaginary Savior: The Image of the Nuclear Bomb in Korea, 1945-1960," *Teach311*, March 14, 2014, <https://www.teach311.org/2014/03/11/article-imaginary-savior-the-image-of-the-nuclear-bomb-in-korea-1945-1960-2008/>; William Burr, "Stopping Korea from Going Nuclear, Part I," National Security Archive, March 22, 2017, <https://nsarchive.gwu.edu/briefing-book/henry-kissinger-nuclear-vault/2017-03-22/stopping-korea-going-nuclear-part-i>.

³² Sheila Jasanoff and Sang-Hyun Kim, "Containing the Atom: Sociotechnical Imaginaries and Nuclear Power in the United States and South Korea."

³³ Jong Wong Lee, "The impact of the Korean War on the Korean economy," *The International Journal of Korean Studies* 5, no 1 (Spring 2001), https://ciaotest.cc.columbia.edu/journals/ijoks/v5i1/f_0013337_10833.pdf.

concrete efforts towards building a nuclear program. This furthers the theory that motivation is not enough for a state to produce nuclear weapons; it must be coupled with economic capability to provide the means to fulfill this motivation.

South Korea once again set its sights on obtaining nuclear weapons in 1973 due to expanding security motivations. Beginning in 1968, South Korea faced increasingly frequent military clashes on the border with North Korea and several larger DPRK aggressions.³⁴ This aggression is exemplified in the Blue House Raid of 1968, when 31 North Korean soldiers went undercover in an attempt to assassinate President Park Chung-Hee. This failed attempt, along with North Korea's strike on a US navy reconnaissance plane in 1969, led to increased security concerns. The United States chose not to retaliate against North Korean aggression due to the recently elected Nixon administration's emphasis on pulling back from direct military intervention.³⁵ This inspired doubt in South Korea about the extended deterrence provided by the United States. If the United States would not intervene militarily when faced with direct aggression from North Korea, how likely would it be to intervene militarily on behalf of another state?

South Korea also attempted to expand its nuclear capability by making deals with France to buy a reprocessing plant. However, these deals fell through after the United States negotiated with France to prevent proliferation.³⁶ The motivation for nuclear weapons in this instance was a security threat, but was not coupled with capability. Figure 3 details the growth in South Korea's economy measured using GNI. Its economy was on the rise, but it was still classified as low

³⁴ Kwanghoon Han, "The Secret History of South Korea's Nuclear Weapons Program | Geopolitical Monitor," *Geopolitical Monitor*, September 24, 2024,

<https://www.geopoliticalmonitor.com/the-secret-history-of-south-koreas-nuclear-weapons-program/>.

³⁵ Mac Bishop, "N. Korea Sent an Assassin to Kill South's President. Here's His Story.," *NBC News*, January 26, 2018,

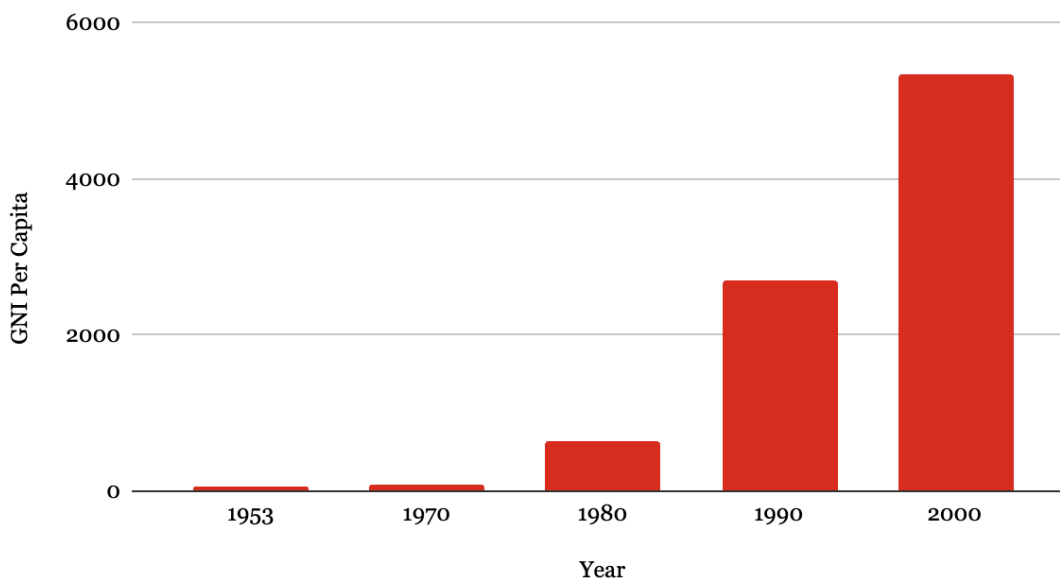
<https://www.nbcnews.com/news/north-korea/north-korean-ex-assassin-recalls-1968-year-mattered-most-n840511>.

³⁶ Kwanghoon Han, "The Secret History of South Korea's Nuclear Weapons Program | Geopolitical Monitor."

income in the 1970s. In 1978, the WDR considered any country to have a GNI of under \$250 per capita to be below the threshold of a middle income country.³⁷ South Korea’s GNI per capita in 1970 began at \$81, placing it well below the threshold of even a middle income country.³⁸ Low income countries had low economic capability, meaning that, under the capabilities model, the South Korean economy in the 1970s was not advanced enough to support a nuclear weapons program. South Korea sought capability in the form of foreign aid from France, but was denied, limiting the progress it could make on nuclear development, leading to the abandonment of nuclear efforts.

Figure 3: South Korean GNI from 1953-2000³⁹

South Korean GNI Per Capita



Lack of capability played a large role in halting the development of nuclear weapons in

South Korea in the 1970s despite strong incentives for nuclear development. This pivotal

³⁷ Divyanshi Wadhwa and Espen Prydz, “Classifying Countries by Income.”

³⁸ “The Korean Economy – the Miracle on the Hangang River,” *Korean Cultural Centre*, accessed May 11, 2025, <https://kccuk.org.uk/en/about-korea/economy/the-korean-economy-the-miracle-on-the-hangang-river/#:~:text=The%20country's%20GNI%20per%20capita,to%20USD%2032%2C115%20in%202019.&text=South%20Korea%20established%20an%20export,of%20insufficient%20capital%20and%20resources.>

³⁹ “The Korean Economy – the Miracle on the Hangang River.”

decision to abandon nuclear weapons development due to a lack of capability demonstrates that the economic capability of a state is a necessary condition of nuclear weapons development. A South Korean ally, the United States, played a crucial role in undermining South Korea's nuclear development in the 1970s. The United States received intelligence of ROK nuclear ambitions in 1974, and, due to the US strategy of non-proliferation, it took immediate steps to prevent deals that would give South Korea nuclear capabilities.⁴⁰ South Korea signed the NPT, similar to North Korea, not to commit to abandoning development of nuclear weapons, but because foreign technical aid, in this case from Canada, was conditional on ratification of the NPT.⁴¹ The United States collaborated with Canada in order to prevent Seoul's acquisition of nuclear technology and took further steps after South Korea signed the NPT in 1975. Ultimately, during this time period, South Korea came closer than ever to developing a nuclear weapon, as it was facing increasing security threats from the North, as well as a decline in trust of its allies. Similar to the first push in the 1950s, South Korea was still not economically advanced enough to carry out its nuclear desires and was unable to gain nuclear arms capability from foreign states due to US intervention. The result was abandonment of nuclear development efforts due, once again, to a lack of means.

Since the 1970s, South Korea's economy has significantly advanced, and the security threat posed by North Korea has grown due to its acquisition of nuclear weapons in 2006.⁴² The main factor contributing to the lack of South Korean nuclear development since the 1970s has been a guarantee of protection under its alliance with the United States. In 1978, the ROK and US governments established the "Combined Forces Command," with the overall goal of

⁴⁰ William Burr, "Stopping Korea from Going Nuclear, Part I."

⁴¹ Se Young Jang, "Bringing Seoul into the Non-Proliferation Regime," *Wilson Center*, September 20, 2017, <https://www.wilsoncenter.org/publication/bringing-seoul-into-the-non-proliferation-regime>.

⁴² "The Korean Economy – the Miracle on the Hangang River."

protecting South Korea from North Korean threats.⁴³ This is one example of a US assurance of South Korean protection. In 2023, President Biden assured South Korea that it is still protected by the United States, saying “look, a nuclear attack by North Korea against the United States, its allies or partisans... partners... is unacceptable and will result in the end of whatever regime were to take such an action.”⁴⁴ Biden and ROK President Yoon Suk-Yeol came to an agreement known as the “Washington Declaration.” This agreement expanded the ROK’s role in nuclear consultations with the United States, providing another layer of collaboration and assurance of collective security under the US nuclear umbrella.⁴⁵ Despite North Korean acquisition of nuclear capability, the strong commitment of the United States to provide South Korea with defence against an attack from North Korea gives South Korea strong enough deterrence to provide security, meaning that nuclear weapons development is now prevented by a lack of motivation.

IV. Conclusion

Ultimately, the conditions under which a state develops nuclear weapons are twofold. A state must have motivation to develop nuclear weapons, which stems from a threat to security. This motivation must be accompanied by state capability, either in the form of an economy able to divert large amounts of funds to developing nuclear technologies, or foreign economic or technological aid. In North and South Korea, a combination of capability and threatened security was seen during periods of nuclear weapons advancement, and absent during periods where advancement was not made. Taking away one or both of these factors will be key to nuclear non-proliferation efforts.

⁴³ Thomas Duval, “Combined Forces Command Underlines Ironclad Commitment during Ceremony,” *US Indo-Pacific Command*, November 8, 2023, <https://www.pacom.mil/Media/NEWS/News-Article-View/Article/3584546/combined-forces-command-underlines-ironclad-commitment-during-ceremony/>.

⁴⁴ David Sanger and Peter Baker, “In Turn to Deterrence, Biden Vows ‘End’ of North Korean Regime If It Attacks,” *The New York Times*, April 26, 2023, <https://www.nytimes.com/2023/04/26/us/politics/biden-south-korea-state-visit.html>.

⁴⁵ David Sanger and Peter Baker, “In Turn to Deterrence, Biden Vows ‘End’ of North Korean Regime If It Attacks.”

In North Korea, both of these conditions were present throughout the period of nuclear weapons development, beginning with an initial capability provided by the Soviet Union's assistance, combined with the motivating factor of competition with South Korea for legitimate control of the Korean peninsula. These conditions continued beyond the 1950s, in North Korea's acquisition of nuclear technologies through signing the NPT. This agreement both allowed North Korea to gain nuclear weapons technology from foreign states and decreased security due to its failure to comply with IAEA inspections. When North Korea signed the Agreed Framework, nuclear weapons development paused due to the assurance from the United States that it would not threaten North Korea, eliminating its main security concern. In the end, this cooperation was broken by a shift in US foreign policy following 2001 that threatened North Korea's relationship with the United States and, therefore, its overall national security. This was the final push necessary to lead North Korea to successful nuclear arms development in 2006.

In South Korea, nuclear development did not occur due to the simultaneous lack of security motivations and economic capability. South Korea did not have the economic capability to build a nuclear weapon until its economy advanced in the 1980s. Before then, it was shut down in its multiple attempts to obtain the foreign aid it needed to supplement its lack of indigenous capability. After the 1980s, the nuclear security threat against South Korea posed by North Korea was effectively neutralized due to US action to assure South Korea of protection under US nuclear power. Therefore, South Korea never had both elements necessary to create the conditions conducive to nuclear weapons development.

This framework can provide insight about present-day Iran. Beginning with capability, Iran's economy was considered upper-middle income as of 2023, meaning that it has funds to

divert into a nuclear weapons development program.⁴⁶ It also received initial technological support for uranium enrichment capability from China and Russia in the 1980s and 90s.⁴⁷ Iran's own economic ability to fund a nuclear weapons program, as well as initial technical support from Russia and China, provide evidence that capability is present. In order to determine whether nuclear development will occur, security must also be taken into consideration. The United States poses one of the largest security threats to Iran, as it sponsors forces that oppose the Iranian government and has labeled Iran as part of an "Axis of Evil," revealing hostility towards the state.⁴⁸ Despite being Iran's strongest nuclear ally, Russia cannot provide Iran with security against the threat of a US attack, as it is unlikely to retaliate with nuclear force against the United States on Iran's behalf. This is reinforced by Russia's recent condemnation of, but lack of action against the United States after the strikes on Iran.⁴⁹ Accordingly, Iran and Russia do not have a notion of collective security.⁵⁰ This lack of security from Iran's principal nuclear ally, coupled with increasing security threats posed by the United States, gives Iran sufficient motivation to develop nuclear weapons. Therefore, both conditions—threatened security and economic capability—necessary for the development of nuclear weapons are present in the case of modern-day Iran.

⁴⁶ Shwetha Eapen, Kathryn Young, and Eric Metreau, "World Bank Country Classifications by Income Level for 2024-2025," *World Bank Blogs*, July 1, 2024, <https://blogs.worldbank.org/en/opendata/world-bank-country-classifications-by-income-level-for-2024-2025>.

⁴⁷ "A History of Iran's Nuclear Program," *Iran Watch*, December 19, 2023, <https://www.iranwatch.org/our-publications/weapon-program-background-report/history-irans-nuclear-program>.

⁴⁸ Robert Hunter, "The Iran Case: Addressing Why Countries Want Nuclear Weapons," *Arms Control Association*, accessed May 11, 2025, <https://www.armscontrol.org/act/2004-12/iran-nuclear-briefs/iran-case-addressing-why-countries-want-nuclear-weapons>.

⁴⁹ Robyn Dixon and Natalia Abbakumova, "Russia Condemns U.S. Strikes on Iran but Takes No Concrete Actions," *The Washington Post*, June 23, 2025, <https://www.washingtonpost.com/world/2025/06/23/iran-russia-alliance-strikes-nuclear/>.

⁵⁰ Nikita Smagin, "Will Moscow Help Washington 'Solve' the Iranian Problem?," *Carnegie Endowment for International Peace*, April 2, 2025, <https://carnegieendowment.org/russia-eurasia/politika/2025/04/russia-usa-iran-relationship?lang=en>.

One or both of these conditions could be eliminated. The June 2025 US strikes on three Iranian nuclear sites affected capability, but it is unclear to what extent. The White House asserts that these sites were “completely obliterated,” setting the Iranian nuclear program back by years, and that the United States will be able to destroy any nuclear facility Iran may build. A leaked assessment from the US Defense Intelligence Agency states that these strikes set the program back by just months, as there are intelligence reports that Iran both still has intact nuclear centrifuges and possibly removed large amounts of HEU from the targeted facilities prior to the attacks. The United States has attempted to negotiate a deal with Iran to prevent uranium enrichment, but Iran has refused, claiming peaceful intent.⁵¹ While it is unclear to what level Iranian capability was reduced by these strikes, it is likely that its security motivations increased. Being directly attacked by a nuclear power provides more incentive for Iran to develop nuclear weapons to deter future attacks. Iran does not have a history of cooperation with the United States, and making a deal with the United States at this point may cause the Iranian government to appear weak to its citizens. Overall, Iran has capability supported by an upper-middle income economy, and some degree of a nuclear program, though the extent of this is ambiguous due to the unknown effects of the recent strikes. These strikes also provided Iran with increased security motivations. Based on the framework established in this study, Iran is likely to achieve nuclear weapons development in the coming years unless one or both of these conditions is eliminated.

Ultimately, I have established the conditions, namely the motivation of security, and the means of capability, under which nuclear weapons development occurs. By identifying these fundamental factors, action can be taken to determine in which states both of these factors are

⁵¹ Warren P. Strobel et al., “U.S. Initial Damage Report: Iran Nuclear Program Set Back by Months, Not Obliterated,” *The Washington Post*, June 25, 2025, <https://www.washingtonpost.com/national-security/2025/06/24/us-iran-bomb-assessment-nuclear-sites-not-destroyed/>.

present, and to form policies around eliminating the influence at least one of them to reduce the likelihood of international instability as a result of nuclear proliferation.