

**WHEN DO NUCLEAR SANCTIONS WORK?  
EXAMINING MAJOR DETERMINANTS OF  
ECONOMIC SANCTIONS IN NUCLEAR COUNTER-PROLIFERATION**

by  
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## **Abstract**

While there are numerous determinants of successful economic sanctions in academia, the scholars of nuclear proliferation suggest that the same conditions will not be applied in sanctions intended for counter-proliferation due to the extremity and high uncertainty of the theme. In this research, the author attempts to verify the connection between sanctions and nuclear proliferation by arguing that five determinants (target's economic capacity, economic interdependence, sanction's multilateral nature, duration, and the diversified proliferation motives) affect the efficacy of nuclear sanction regimes. An empirical analysis of the 27 cases of proliferation attempts, seven sets of counter-proliferation sanctions, and case studies on North Korea and India indicate that two of the initial determinants display significant influence over the outcome of nuclear sanctions. The results of the research suggest that the target's lower level of economic integration to international commerce, and diversified sources of proliferation model undermine the efficacy of counter-proliferation sanctions.

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## Introduction

Throughout the 1980-1990s, economic sanctions have been one of the most popular diplomatic policy tools. Such popularity came from their non-violent nature of achieving a foreign policy objective without the use of military forces that can be burdensome in terms of both resources and politics.<sup>1</sup> Even in the wake of skepticism over sanctions in the 21st century, there are approximately 8,000 sanctions targets imposed by the US government, with the United Nations Security Council (UNSC) maintaining 14 sanctions regimes for various purposes.<sup>2</sup> The flexibility of economic sanctions is another source of its high popularity, with the applications ranging from narcotics trafficking, terrorism, to regional conflict resolutions. However, sanctions have been particularly prevalent in nuclear nonproliferation. Economic sanctions on the nations not abiding by the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) are considered nearly as default options. In the US, Symington and Glenn amendments of the Arms Export Control Act mandated the ban of all US economic assistance and export credits to the nuclear proliferating states. Likewise, all the non-authorized nuclear weapon states pursuing a nuclear weapon program were subject to financial coercion, with the exception of Israel.

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<sup>1</sup> Jesse Helms, "What Sanctions Epidemic?" *Foreign Affairs*, 78 (1), (1999), pp.2-8.

<sup>2</sup> U.S. Department of Treasury, "Specially Designated Nationals And Blocked Persons List (SDN) Human Readable Lists," Resource Center, (Feb 2020); U.S. Department of Treasury, "Consolidated Sanctions List Data Files," Resource Center, (Feb 2020); United Nations Security Council, "Sanctions," <https://www.un.org/securitycouncil/sanctions/information>, (Feb 2020).

Contrary to their widespread usage, however, numerous practitioners and scholars from the security and economic sectors criticize the efficacy of sanctions. In fact, scholars like Galtung and Pape have even questioned the very definition of 'success' in sanctions usage,<sup>3</sup> undermining the claims from the pro-sanctions school of thought. This prevalent skepticism applies to the nuclear-related economic coercion as well. Only four of the previous counter-proliferation sanctions successfully induced the target to renounce its nuclear development.<sup>4</sup> Hence, because most cancellations of nuclear weapons programs and disarmaments involve direct / indirect military pressure<sup>5</sup> or a dramatic collapse of the original owner state,<sup>6</sup> the efficacy of coercive diplomacy in a nuclear crisis is questioned by practitioners and scholars alike.

The unsuccessful outcome of economic coercion is also observed in one of the most recent cases in the nuclear nonproliferation issue, North Korea. Ever since its first nuclear crisis in 1992-1994, the US and international organizations like the International Atomic Energy Agency (IAEA) have been imposing political and economic pressures to renounce the North Korean pursuit of a nuclear weapon.<sup>7</sup> Although there are endless debates on the

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<sup>3</sup> Robert A. Pape, "Why Economic Sanctions Do Not Work," *International Security*, Vol. 22, No. 3, (Fall 1997), pp. 90-136; Kimberly Ann Elliott, "The Sanctions Glass: Half Full or Completely Empty?" *International Security*, Vol. 23, No. 1, (Summer 1998), pp. 50-65.

<sup>4</sup> Iran, Iraq, Libya, and Syria

<sup>5</sup> Iraq involving direct military intervention and Libya involving indirect military pressure

<sup>6</sup> Soviet Union, Ukraine, Belarus, Kazakhstan, and South Africa related to Soviet Union's collapse

<sup>7</sup> Stephan Haggard, and Marcus Noland, "Hard Target: Sanctions, Inducements, and the Case of North Korea," Stanford University Press, (2017), pp. 16.

approaches and assumptions in persuading Pyongyang, most practitioners and scholars agree that the combination of political and economic efforts encompassing numerous nations and international bodies failed its mission. As of now, the Democratic People's Republic of Korea (DPRK) is a non-authorized nuclear state under the NPT, acquiring sufficient plutonium production for a weapons project back in 2004,<sup>8</sup> along with the missile sized warheads in 2016.<sup>9</sup> According to the Defense Intelligence Agency (DIA)'s assessment, the DPRK is also estimated to have developed a nuclear-capable Inter Continental Ballistic Missile (ICBM) in 2018.<sup>10</sup>

In this context, this research examines what the most significant determinants for a successful nuclear counter-proliferation sanction regime are. Because the research focuses on sanctions as coercive diplomacy, not as the direct means to prevent nuclear technology acquisition, the study concentrates its scope on the determinants on the demand-side.<sup>11</sup> Prior to the primary analysis, however, the research demonstrates a literature review of

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<sup>8</sup> Graham Allison, "Global Challenges of Nuclear Proliferation," in *Nuclear Proliferation: Risk and Responsibility*, ed. Allison et al., A Report to the Trilateral Commission: 60, (2006), pp.1-25.

<sup>9</sup> Anna Fifield, "North Korea conducts fifth nuclear test, claims it has made warheads with 'higher strike power'," *The Washington Post*, (9 Sep 2016), [https://www.washingtonpost.com/world/north-korea-conducts-fifth-nuclear-test-as-regime-celebrates-national-holiday/2016/09/08/9332c01d-6921-4fe3-8f68-c611dc59f5a9\\_story.html](https://www.washingtonpost.com/world/north-korea-conducts-fifth-nuclear-test-as-regime-celebrates-national-holiday/2016/09/08/9332c01d-6921-4fe3-8f68-c611dc59f5a9_story.html).

<sup>10</sup> Warrick, Nakashima and Fifield, "North Korea now making missile-ready nuclear weapons, U.S. analysts say," *The Washington Post*, (8 Aug 2017), [https://www.washingtonpost.com/world/national-security/north-korea-now-making-missile-ready-nuclear-weapons-us-analysts-say/2017/08/08/e14b882a-7b6b-11e7-9d08-b79f191668ed\\_story.html](https://www.washingtonpost.com/world/national-security/north-korea-now-making-missile-ready-nuclear-weapons-us-analysts-say/2017/08/08/e14b882a-7b6b-11e7-9d08-b79f191668ed_story.html).

<sup>11</sup> As opposed to the supply-side approaches such as trade restraint of the dual-use nuclear technology.

two core concepts related to the theme: nuclear proliferation, and economic coercion. The methods section after the literature review introduces the adopted research methods and describes how each specific method contributes to a deeper comprehension of the agenda. Hence, the definition of 'successful nuclear sanctions' within this research will be clarified in this chapter.

The primary data section covers two agendas: an overview of the economic sanctions in search of nuclear nonproliferation, and the analysis of determinants of the successful nonproliferation sanction regime. The first part examines the counter-proliferation sanctions and determinants using a quantitative approach (multivariate regression), and the second part examines the significant contributors in detail. This qualitative explanation is conducted using a cross-case case study method. Further descriptions will be provided in the methods section.

Finally, the discussion chapter presents how the findings from this research contribute to the existing academic collections, along with the limitations found during the study process.

## **Literature Review**

### **i) Literature on Nuclear Proliferation**

Ever since the introduction of nuclear weapons, there have been countless pieces of literature on why nations seek these weapons and what significance they hold in international politics. If one hopes to seize a nuclear proliferation attempt through the economic coercion, the coercer must understand the rationale behind the target's nuclear pursuit. Among the studies that are elaborate on the reasons for nuclear development, Sagan suggests three models that can set the basis for the demand-side proliferation debate: security model, domestic politics model, and norms model.<sup>12</sup> Likewise, this part of the literature review examines pieces of literature falling under the three models of nuclear proliferation.

### **Security Model**

The first model for demand-side proliferation is the security model. This model comes from the political neorealist school of ideas, which claims that every nation is bound to self-responsible national security and sovereignty due to the anarchical nature of the international system.<sup>13</sup> According to the security model's perspective, the massive power of the nuclear weapons will

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<sup>12</sup> Scott D. Sagan, "Why Do States Build Nuclear Weapons: Three Models in Search of a Bomb," *International Security*, Vol. 21, (Winter 1996-1997), No. 3. pp. 54-86.

<sup>13</sup> Kenneth N. Waltz, "Theory of International Politics," New York, Random House, (1979); Hans j. Morgenthau, and Kenneth W. Thompson, "Politics Among Nations: The Struggle for Power and Peace." McGraw-Hill, Sixth Edition, (1985), pp. 3-13.

induce any nations that encounter a nuclear-armed rival state or massive threat from conventional force disadvantage to seek nuclear capacity or measures with equivalent impacts. Because of this, nations with capability will pursue nuclear weapons development, and those without the capability will form a nuclear alliance with existing nuclear power under the security model's logic. As a result, measures to lower the insecurities, such as protective nuclear guarantees, extended deterrence, or negative security assurance, can promote nonproliferation in the short term. However, as "proliferation begets proliferation,"<sup>14</sup> it is assessed that nonproliferation efforts can delay the proliferation but cannot completely prevent the spread of nuclear weapons.<sup>15</sup>

Aside from Sagan's framework, some earlier scholars also strived to analyze states' nuclear intentions, such as Epstein. Epstein's claims on the security model, or what he called 'Military Security,' suggests that the impacts of the nuclear arms are so significant that all nations will be seeking for suitable alternatives within their power capacities. This study also shares the idea that states with more power will pursue their own nuclear weapons programs, whereas the weaker ones will strive for a hegemonic ally that will provide nuclear deterrence. In the later part, Epstein recommends five disincentives against potential proliferators: positive nuclear protection guarantees, negative security assurances, nuclear states being responsible

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<sup>14</sup> George P. Schultz, "Preventing the Proliferation of Nuclear Weapons," US Department of State, Current Policy No. 631, (29 Nov 1984), pp. 18.

<sup>15</sup> Scott D. Sagan, "Why Do States Build Nuclear Weapons: Three Models in Search of a Bomb," *International Security*, Vol. 21, (Winter 1996-1997), No. 3. pp. 57-63.

for NPT disarmament obligations, being provided conventional military capacities, and maintaining a strong force in the hands of the UNSC for both the conventional / nuclear deterrence. Hence, Epstein, as well as Sagan, asserts that national security is the core rationale behind nuclear proliferation.<sup>16</sup>

Waltz partially contributes to this discussion by illustrating the significance of nuclear weapons in strategic deterrence. Waltz first points that the notion of 'deterrence' has existed long before the advent of nuclear technology and that deterrence used to be more strategy-based rather than a specific weapon-based in the previous stages. Nevertheless, he analyzes that the nuclear weapons reversed the existing equations because the significance of nuclear arms derives more from their existence itself, rather than from the strategies to utilize them.<sup>17</sup> In addition, Waltz even comments that nuclear weapons severely undermine the significance of conventional forces by nullifying their roles in nuclear nations' collisions over vital interests.<sup>18</sup> Likewise, it can be inferred that nations strive to acquire nuclear weapons for the strategic security advantage over conventional weapons, which can only be mitigated by the procuring nuclear weapons capacity.

Another piece of important research is Singh and Way's 'The Correlates of

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<sup>16</sup> William Epstein, "Why States Go and Don't Go Nuclear," *The Annals of the American Academy of Political and Social Science*, Vol. 430, (Mar 1977), pp. 16-28.

<sup>17</sup> Bernard Brodie, "War and Politics," New York: MacMillan, (1973).

<sup>18</sup> Kenneth N. Waltz, "Nuclear Myths and Political Realities," *American Political Science Review*, Vol. 84, No. 3, (Sep 1990), pp. 731-745.

Nuclear Proliferation.’ In this study, the authors categorize proliferation factors into three sets: external determinants, domestic determinants (both demand-side factors), and technological determinants (supply-side factor). Using the multi-nominal logit model, the research identifies that external threats and economic developments are the most influential factors in developing nuclear arms. Specifically, GDP per capita, industrial capacity index, and the involvement in the world economy were accounted to be significant correlates among the economic factors. The authors also comment that while high economic interdependence can dissuade some potential proliferators, the direct financial coercion or incentives are not major determinants, as observed from the limited range of influence of sanctions applied to India and Pakistan.<sup>19</sup>

Finally, Roth adds to the security model. He suggests that from the neorealist view, smaller adversaries of a superpower will seek to acquire nuclear weapons for deterrence purposes out of their robust deterrence effects even with a small number of nuclear forces. Yet, he concludes that the security model cannot predict the outcome of proliferation attempts, despite its identification of states’ intent, because it does not account for domestic level factors that lead to policy decisions.<sup>20</sup>

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<sup>19</sup> Singh and Way, “The Correlates of Nuclear Proliferation: A Quantitative Test,” *Journal of Conflict Resolution*, Vol. 48, No. 6, (Dec 2004), pp.859-885.

<sup>20</sup> Roth, and Krieger, “Nuclear Weapons in Neo-Realist Theory,” *International Studies Review*, Vol. 9, No. 3, (Autumn, 2007), pp. 369-284.

## **Domestic Politics Model**

The next model discussed is the domestic politics model. This model concentrates on the role of domestic actors in influencing a nation's pursuit of nuclear weapons. Sagan suggests three main components of the domestic politics model: politicians seeking public support, military leaders, and atomic scientists. He analyzes that nuclear proliferation is highly likely when the three actors align their search of nuclear weapons pursuit, eventually acquiring full control over the nation's government. This theory emphasizes that the role of bureaucrats can sometimes be more than merely complying with the decisions made from their leadership. Instead, it proposes that this bureaucratic coalition exerts influence on the leadership and public's perception of the cost and benefit of going nuclear. Furthermore, this article states a number of policy recommendations, including limiting the military expenditure of potential proliferator through conditional loans, reinforcing civilian control of the military, and providing alternative sources of employment for the internal components of proliferation.<sup>21</sup>

Lavoy is another advocate of the domestic politics model. In his literature, Lavoy recognizes the security and norms model but evaluates that security and normative factors possess empirical and logical weakness, failing to explain the strategic logic and politics behind nuclear weapons programs. In

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<sup>21</sup> Scott D. Sagan, "Why Do States Build Nuclear Weapons: Three Models in Search of a Bomb," *International Security*, Vol. 21, (Winter 1996-1997), No. 3. pp. 63-73.

contrast, the research states that the national elites determined to develop nuclear arms highlight the security threat imposed on the nation repeatedly, to promote a firm belief among the public that nuclear arms capacity can grant them with military security and political sovereignty.<sup>22</sup>

Solingen further develops Lavoy's argument in her study, 'The domestic Sources of Nuclear Posture.' She argues that the expansion of democracy and international economic integration has divided the industrializing states into two groups: those who pursue domestic support through economic liberalization, and the opposers of global integration. With this distinction, Solingen suggests that when dealing with 'fence-sitting' states, potential proliferators who are sitting on the edge of the nuclear arms programs with the capacity to cross the fence according to their willingness, the heavy financial pressure should not be applied if the fence-sitter belongs to the liberalization group. This is because the external threats make the domestic conditions unsuitable for the liberalizers to maintain internal support, thus making proliferation more likely. The research also mentions that domestic actors would be highly hesitant to dissuade the public from denuclearization by disclosing the actual cost and benefit of the nuclear arms. As the "Nuclear Myths" of ensured security and nationalism compensate the politicians with robust public support, the governing faction will not be motivated to give up this political advantage. Finally, Solingen remarks that since these domestic sources play an immense role in the proliferation among rogue nations like

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<sup>22</sup> Peter R. Lavoy, "Nuclear Myths and the Causes of Nuclear Proliferation," *Security Studies*, 2:3-4, (1993), pp. 192-212, DOI: 10.1080/09636419309347524

North Korea, an analysis of each rogue state's internal dynamics will contribute to the counter-proliferation efforts.<sup>23</sup>

In her later works, such as 'Sanctions, Statecraft, and Nuclear Proliferation,' Solingen further refines her assertions on the domestic sources of nuclear arms. The book specifies the previous two groups of industrializing nations into 'Internationalizing' and 'Inward looking' models of political survival. Then, Solingen moves on to comment that the Inward looking leaders who seek economic nationalism, or rigid ethnic / religious values tend to use nuclear weapons as a mechanism to persuade the public, claiming that nuclear arms acquisition is a step towards modernization as well as a deterrent against hegemonic oppressors. On the contrary, as the Internationalizing model is more susceptible to economic influence such as sanctions and inducements, it performed the role of self-deterrent, significantly limiting nuclear arms attempts from the nations belonging to this model.<sup>24</sup>

### **Norms Model**

The third model analyzing the demand-side proliferation motive is the norms model. According to Sagan, once again, this model interprets that a state's decisions originate from norms and beliefs about what each nation

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<sup>23</sup> Etel Solingen, "The Domestic Sources of Nuclear Postures: Influencing 'Fence-sitters' in the Post-Cold War Era," Institute on Global Conflict and Cooperation, Policy Paper 8, (Oct 1998).

<sup>24</sup> Etel Solingen, "Introduction: the domestic distributional effects of sanctions and positive inducements," in *Sanctions Statecraft, and Nuclear Proliferation*, ed. Etel Solingen, Cambridge University Press, (2012), pp. 3-28.

considers as legitimate behavior according to its relative international position. From this perspective, a nation's pursuit of nuclear weapons programs may reflect its leader's perception of an appropriate response to its historical and geopolitical conditions. Another implication from the norms model is that from the sociological view; high tech military capacity such as nuclear weapons can be considered as a sign of modernization. Like airlines, nuclear power plants, or international sports teams, certain countries may aspire to acquire nuclear arms, as they are a symbol of national advancement.<sup>25</sup>

Epstein states that political prestige is another driving force behind why some nations proliferate. According to Epstein, some leaders and elites believe that nuclear arms promote national prestige and reserve a higher international position. He suggests nations such as the UK, France, China, and India, who went after nuclear weapons programs to maintain the status of great power. This research also asserts that other prestige related objectives of nuclear proliferation include assuring a significant voice in international organizations, redressing one's peripheral condition in the international hierarchy, and validating sovereignty against the hegemonic powers.<sup>26</sup>

As for another perspective regarding the norms model, Chafetz, Abramson, and Grillot introduce role theory. The role theory argues that a perceived

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<sup>25</sup> Scott D. Sagan, "Why Do States Build Nuclear Weapons: Three Models in Search of a Bomb," *International Security*, Vol. 21, (Winter 1996-1997), No. 3. pp. 73-85.

<sup>26</sup> William Epstein, "Why States Go And Don't Go Nuclear," *The Annals of the American Academy of Political and Social Science*, Vol. 430, *Nuclear Proliferation: Prospects, Problems, and Proposals*, (Mar 1977), pp. 16-28.

position of each nation in its security environment creates 'role conception,' an international expectation of the state's role. This role conception influences the public and bureaucrats' assessments on what decisions a nation makes to a given circumstance. Using this role theory, the article analyzes that the Ukraine is likely to invest in nuclear weapons technology, whereas Belarus is less likely to do so. This study also makes evaluations of why rogue nations like Pakistan and North Korea proliferate, even withstanding the political and economic pressures from the international society. The authors analyze that the role conception of these two states is 'the rebels against imperial aggressors,' one against India and the other against Western powers, respectively.<sup>27</sup>

Hymans adds more insights to the discussion of the norms and conceptions by suggesting the notion of 'National Identity Conception' (NIC). According to his literature 'The Psychology of Nuclear Proliferation,' NIC is "an individual's understanding of the nation's identity – his or her sense of what the nation naturally stands for and of how high it naturally stands..."<sup>28</sup> Likewise, NIC is highly similar to the previous concept of 'role conception,' but with the analysis level of individuals. In addition, Hymans poses four types of NIC using two dimensions: status perception, where a leader identifies the nation to be superior to others or inferior to others, and solidarity perception if the person

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<sup>27</sup> Chafetz, Abramson, and Grillot, "Role Theory and Foreign Policy: Belarussian and Ukrainian Compliance with the Nuclear Nonproliferation Regime," *Political Psychology*, Vol. 17, No. 4, (Dec 1996), pp. 727-757.

<sup>28</sup> Jacques E. C. Hymans, "The Psychology of Nuclear Proliferation: Identity, Emotions, and Foreign Policy," Cambridge University Press, (2006).

interprets 'us' and the rest of the world to be in a conflict-relationship or not. As a result, the four types of NIC are: 'Sportsmanlike nationalist,' 'Sportsmanlike subaltern,' 'Oppositional nationalist,' and 'Oppositional subaltern.' After assessing the NICs of nine leaders from four nations (France, Australia, Argentina, and India), the book concludes that the 'Oppositional nationalist' type of NIC, the one which tends to consider the nation to be superior to others, and counts the others to be against 'us,' are more prone to seek nuclear arms programs. Out of this observation, Hymans offers a number of policy implications at the end of the literature. First, from the demand-side perspective, he anticipates that neither economic / political restraints from the community of existing nuclear states will persuade the proliferators to denounce nuclear pursuit. Rather he claims that due to the leaders' likely NIC type, imposing non-existential threats may even solidify their nuclear decisions. On the other hand, Hymans shows a positive attitude toward the preventative war alternative. This is because a preventative war represents a massive threat to the state's leadership, such as the regime change. Nevertheless, he concludes that the preventative war, too, is highly unlikely to be successful due to the moral concerns, costs, and implications of shared burdens among international society.<sup>29</sup>

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<sup>29</sup> Jacques E. C. Hymans, "The Psychology of Nuclear Proliferation: Identity, Emotions, and Foreign Policy," Cambridge University Press, (2006).

## ii) Literature on Economic Sanctions

The popularity of sanctions began in the 1960s; however, the history of economic coercions dates back to as early as the days of World War I. Just like the nuclear proliferation literature, academic theories on economic means in coercive diplomacy transformed over time, and so did its preference among policymakers. As mentioned in the introduction, most pieces of literature examined in this portion are written after the 1970s, throughout the economic sanctions' prime days into the rise of skepticism over them. This section reviews the pro-sanctions school of scholars, scholars who question its effectiveness, and articles on crisis-related economic coercion.

However, we need to study the purposes and features of this economic coercion, for a better understanding of the sanctions-debate before going further. On this, Galtung offers a decent guiding point by introducing 'the general theory of economic sanctions' that defines the economic sanctions as actions involving financial pressure with one or more senders and receivers "with either or both of two purposes: to punish the receivers by depriving them of some value and / or make the receivers comply with certain norms the senders deem important."<sup>30</sup> This indicates that sanctions at the time were also used to inflict pain on the target for its previous behaviors. However, Galtung denounces the punishment aspect and zeros the discussion into measures that induce other international actors to comply. To summarize, the logic leading to compliance is as follows: economic damage leads to

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<sup>30</sup> Johan Galtung, "On the effects of International Economics Sanctions: With Examples from the Case of Rhodesia," *World Politics*, Vol. 19, No. 3 (Apr 1967), pp. 379.

economic disintegration, which causes political disintegration. This political instability will then force the target's leadership to comply.<sup>31</sup>

Baldwin is another scholar who made an immense contribution to the comprehension of economic tools in the foreign policy settings. In his book 'Economic Statecraft,' Baldwin emphasizes that state affairs encompass both the domestic and foreign side of the governmental decisions, indicating that utilizing economic measures should not be considered inappropriate because they are applied for diplomatic purposes. He claims that there is a limited understanding of the financial tools as statecraft compared to military or diplomatic measures that have been favored by the nation-states for an extensive period. To clarify, the book summarizes three central aspects of economic statecraft: policy instrument (financial tools), domain (one or more target states), and scope (any component of the target's decision such as behaviors, norms, beliefs, etc.). One significant difference between Baldwin and Galtung's view is that Baldwin's definition is broader as he considers any alterations, including even the invisible factors like norms and beliefs, to be the goal of economic statecraft.<sup>32</sup>

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<sup>31</sup> Johan Galtung, "On the effects of International Economics Sanctions: With Examples from the Case of Rhodesia," *World Politics*, Vol. 19, No. 3 (Apr 1967), pp. 378-416.

<sup>32</sup> David A. Baldwin, "Economic Statecraft," Princeton University Press, (1985).

## Supporters of Economic Sanctions

Hufbauer, Schott, Elliott, and Oegg's (referred to as HSE since Oegg was added in the third edition) work 'Economic Sanctions Reconsidered' is the initiator that incited the applications of economic sanctions in foreign policy. This research reviews 204 case studies of economic sanctions used from 1914 to 2006 (as of the third edition), to assess their outcomes and verify the economic sanctions' efficacy as a policy tool. The authors define the five objectives of sanctions: 1) moderate changes in the target behavior, 2) destabilization of the target, 3) prevention of minor military movement, 4) undermining the military capacity of the target, and 5) significant changes in the target policy. Along with these, HSE suggests the scale for policy outcomes and sanctions' contribution to the result, both ranging from 1 (lowest) to 4 (highest). Using such standards, 34 percent of the 204 cases were analyzed to be successful, with approximately 30 percent of accomplishment rate under attempts of significant policy alteration (e.g., regime change attempts, impairing adversarial military). As for the recommendations, the following are the major policy implications: 1) sanctions are less effective when dealing with autocratic regimes with high economic power, 2) sanctions must be deployed with maximum impact to avoid the use of military, 3) a coalition of coercers does not guarantee the higher likelihood of successful, and 4) sanctions require the precise calculation of their costs and benefits to prevent the loss of coercer's domestic support.<sup>33</sup>

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<sup>33</sup> Hufbauer, Schott, Elliott, and Oegg, "Economic Sanctions Reconsidered," Peterson

After HSE's research, there were numerous studies, from both supporters and critics, regarding the efficacy of coercive diplomacy using economic measures. After a few rounds of questions on the agenda, Gibson, Davis, and Radcliff reassessed the successful applications and findings. The article examines the same set of case studies used by Hufbauer et al. (the cases from the second edition of the book, year from 1914 to 1989) with the logistic regression analysis method. On the contrary to its hypothesis, the paper identifies that the economic power level of the target state or the import / export dependency of the receiver on the sender did not exhibit significant influence in the successfulness of the economic coercion. Rather, the analysis proves that if the objective was to destabilize the target to incur a behavioral change, the most influential determinant in the success of sanctions is the target's stability before the application of the sanctions. In addition, the authors comment that another major discovery is that the relative effectiveness of coercion displayed a downward trend as time goes on.<sup>34</sup>

Coming back to Baldwin's ideas, he proposes counter arguments as a response to the criticisms on his interpretation of economic sanctions and evaluation of success. First, Baldwin rebuts that the effectiveness of economic statecraft must be judged in a matter of degree, rather than distinguishing the success and failure according to compliance and non-compliance. Secondly,

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institute for International Economics, third edition, (2009).

<sup>34</sup> Dashti-Gibson, Davis, Radcliff, "On the Determinants of the Success of Economic Sanctions: An Empirical Analysis," *American Journal of Political Science*, Vol. 41, No. 2, (Apr 1997), pp. 608-618.

although the paper admits that there can be disputed views on the success rate of sanctions, it stresses that empirical verifications do not explain the logic of why the critics do not believe that sanctions work. In the end, the article concludes that the 'failed' economic coercion that critics suggest should be assessed in relative terms with other policy tools such as military or diplomatic measures, as well as in spectrum, not bipolar standard.<sup>35</sup>

Elliott also responds to skepticism on her previous work with Hufbauer and Schott. In her later research 'The Sanctions Glass: Half Full or Completely Empty?', Elliott provides more explanation on the rationale behind the initial study's broad definition of economic sanctions. She claims that as economic pressure and military force are not exclusive, but supplements reinforcing each other, like different branches of military supporting each other in a joint operation. Likewise, she suggests that when economic and military measures are mingled, "some degree of success may be attributed to sanctions if they contributed at least modestly." Hence, Elliott even comments that sanctions are not expected to produce significant outcomes when applied independently. Although Elliott does not evaluate sanctions to be completely ineffective, she points out a few determinants that influence the efficacy of economic coercion, such as economic interdependence, multilateral application, and level of enforcement.<sup>36</sup>

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<sup>35</sup> Baldwin, and Pape, "Evaluating Economic Sanctions," *International Security*, Vol. 23, No. 2, (Fall 1998), pp. 189-198.

<sup>36</sup> Kimberly Ann Elliott, "The Sanctions Glass: Half Full or Completely Empty?" *International Security*, Vol. 23, No. 1, (Summer 1998), pp. 50-65.

For more recent scholars, Kaempfer and Lowenberg support the effectiveness of the sanctions' policy application. They first introduce three objectives of economic coercion: sanctions applied to please the domestic public of the sender's side, sanctions to punish the target by inflicting damage, and sanctions to coerce a specific behavior. The authors imply that one case of sanctions may have all three goals at the same time. Moreover, this report claims that targeted sanctions or smart sanctions can be more effective in certain scenarios. Targeted sanctions are the type of economic coercion that aims for restraining the range of financial burden on specific proponents of the sanction receiver. Usually, these types of sanctions are applied to political groups, bureaucratic elites, or military organizations within the target nation to diminish the internal regime support and induce instability. Another benefit of this type of economic pressure is the moral high ground is minimizing harms inflicted on the target's general public who do not have close linkage with the decision-making process. In the end, this article asserts that smart sanctions can be more effective than comprehensive sanctions when the imposer has adequate political, social, and economic information of the target. This is because the smart sanctions can gather stronger international as well as domestic support.<sup>37</sup>

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<sup>37</sup> Kaempfer, and Lowenberg, "Targeted Sanctions: Motivating Policy Change," *Harvard International Review*, (Fall 2007), pp. 68-72.

## Critics of Economic Sanctions

This portion of the literature review investigates the opinions of sanction critics. The critics are mainly divided into two groups, one arguing that economic coercion is not a valid policy tool at all, and the other claiming that the method only operates under a confined circumstance or those suggesting potential reinforcements to enhance the effectiveness. In reality, the stance of the latter may not be immensely different from the supporters aside from the degree perceived effectiveness of the economic sanctions.

Returning to Galtung, he opposes the validity of economic sanctions' foreign policy application from two rationales. First, Galtung considers the universality, one primary condition of economic coercion that necessitates support from most of the international society, to be implausible. Hence, even if the universal pressure was present, he anticipates an adverse impact of providing stimulus for internal integration, along with insignificant economic damage in nations with substantial domestic resources and economy. Moreover, the study suggests that countermeasures against sanctions will harshly undermine the pressures, even when all the conditions are met. For instance, states that consider themselves as a minority in the international order may collaborate to alleviate the coercive force, or potential targets will diversify their trading partners to minimize the risk of having their economy demolished by losing several trade partners.<sup>38</sup>

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<sup>38</sup> Johan Galtung, "On the effects of International Economics Sanctions: With Examples from the Case of Rhodesia," *World Politics*, Vol. 19, No. 3 (Apr 1967), pp. 378-416.

Robert Pape, one of the harshest critics of economic sanctions, denounce the successful cases as well as the definition of 'successful sanctions.' Pape introduces two criticisms of the existing pro-sanctions literature. He states that the broad definition of economic sanctions established by HSE overlaps with other types of financial measures in international politics like commercial negotiations, and economic warfare. Such a vague distinction not only leads to a limited understanding of sanctions, but it also leaves doubts in the case studies considered successful. The article also comments that an extensive definition of economic sanctions, such as that of Baldwin, causes type II hypothesis error of leaving hypothesis un-rejectable and unverifiable. Finally, the research points out that HSE failed to isolate the contribution of sanctions from that of military pressure. Pape highlights that nearly half of the cases introduced as the outcomes of successful sanctions were mixed consequences of economic and military influence, once again undermining the credibility of HSE's research.<sup>39</sup>

### **Crisis related Sanctions**

There are a few works of literature concentrated on the economic sanctions applied in crisis environments. Lektzian and Regan analyzed the efficacy of financial pressures in controlling the duration of civil conflicts using time-series cross-section analysis. The authors conclude that multilateral or institutional

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<sup>39</sup> Robert A. Pape, "Why Economic Sanctions Do Not Work," *International Security*, Vol. 22, No. 2, (Fall, 1997), pp. 90-136.

sanctions are more effective in enforcement mechanisms as well as maintaining the constant pressures, but military interventions were the decisive determinant in influencing the conflict period. Furthermore, the participation of hegemonic powers in both the economic coercion and military intervention was another major factor in the duration of civil conflict.<sup>40</sup>

Miyagawa and Ohno examine the efficacy of economic sanctions in significantly altering the target's behavior, especially in the process of nuclear proliferation. They calculate the expected damage of a hypothetical set of sanctions under multiple dependent variables to evaluate what scenarios are ideal for the economic coercion to acquire policy objectives. The paper suggests several findings from the analysis. First, if economic sanctions fail to inflict sufficient damage to halt the nuclear proliferation process, the attempt backfires by creating a domestic cohesion within the target. Hence, Miyagawa and Ohno also argue that sanctions are more likely to be effective in counter-proliferation when they are applied in the initial stage of the target's nuclear weapons program, and when the economic connection between the coercer and the receiver is high.<sup>41</sup>

Finally, Stein analyzes the impact of utilizing financial measures, both the sanctions and inducements, to influence the outcome of nuclear proliferation. He asserts that the coercion intends to divide the opponent and acquire a

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<sup>40</sup> Lektzian & Regan, "Economic sanctions, military interventions, and civil conflict outcomes," *Journal of Peace Research*, Vol. 53(4), (2016), pp. 554-568.

<sup>41</sup> Miyagawa and Ohno, "Nuclear Bombs and Economic Sanctions," *Southern Economic Journal*, Vol. 82, No. 2, (Oct 2015), pp. 635-646.

political goal in exchange for financial capacity. In this process, the regime types of the sanctioner and the target are essential determinants because they determine the interaction procedures of how the states acquire supports from the domestic society. In this view, Stein comments that having a democratic coercer and an autocratic receiver makes the economic measures least likely to succeed. Moreover, he also mentions that though the market measures may be able to influence the target's economy, such financial impact does not always correlate with the desired political effect.<sup>42</sup>

Out of reviewing the existing literature, the research identified several major determinants, including: proliferation motives, economic status, leader's NIC perception, domestic political stability prior to the sanctions' application. However, the author found no consensus among these works on what factors contribute most significantly to successful nonproliferation sanctions. The remaining sections of this research strive to fill this gap of 'What are the most important conditions for a successful counter-proliferation sanctions regime.'

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<sup>42</sup> Arthur A. Stein, "Sanctions, inducements, and market power," in *Sanctions Statecraft, and Nuclear Proliferation*, ed. Etel Solingen, Cambridge University Press, (2012), pp. 29-55.

## **Hypothesis**

As the research sets five main determinants over the success of nuclear sanctions (economic capacity, economic interdependence, multilateral coercion, duration of the sanctions, and the proliferation motives; the definitions of each determinants are further explained in Appendix, [Table 1], “Five Determinants Explained”), the hypothesis suggests potential conditions for each contributing factor. This paper hypothesizes that the receiver’s high economic capacity, low level of integration to the global market, unilateral nature of the sanction, extended duration, and the diversified proliferation motives diminish the efficacy of the nonproliferation sanctions regime.

## **Methods**

To distinguish the outcomes of each set of sanctions coherently, this research adopts Pape’s view, that the acquisition of political behavioral change in the target state should be the sole standard measuring the sanctions’ success. However, it is unrealistic to isolate the impacts of economic coercion from diplomatic and military influence in nonproliferation attempts, and there is a limited number of nuclear proliferation cases involving both the economic and military pressure. In this sense, any differences in the receiver’s behavior will be accounted for as sanctions’ influence.

The quantitative analysis examines the efficacy of economic coercion in counter-proliferation using a multivariate regression model. The first set of regressions (Model 1-1, 1-2) uses records from 27 nations that sought nuclear

weapons programs in the past.<sup>43</sup>

The second group of regression incorporates five determinants (economic capacity, economic interdependence, multilateral nature of the sanctions, duration of the sanctions, and proliferation motives) to evaluate the impact and statistical validity of nuclear sanctions. This analysis uses a subset of eight states from the previous list of 27 proliferators. These eight states were selected because the cases are proliferators who became the targets of nonproliferation sanctions according to the open-source data on nonproliferation attempts.<sup>44</sup>

The qualitative analysis section uses a cross-dimensional case study method examining the set of nuclear sanctions on North Korea and India. These cases are selected because they coherently explain the statistically significant determinants (economic interdependence and diversified proliferation motives).

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<sup>43</sup> Algeria, Argentina, Australia, Brazil, Canada, Egypt, Germany, Greece, India, Indonesia, Iran, Iraq, Israel, Italy, Japan, Libya, North Korea, Pakistan, Romania, South Africa, South Korea, Sweden, Switzerland, Syria, Taiwan, Turkey, and Yugoslavia; Graham Allison, "Global Challenges of Nuclear Proliferation," in *Nuclear Proliferation: Risk and Responsibility*, ed. Allison et al., A Report to the Trilateral Commission: 60, (2006), pp.3, Figure1-1. (With the update of North Korean nuclear arms acquisition).

<sup>44</sup> Nuclear Threat Initiative, "Country Profiles", <https://www.nti.org/learn/countries/>, (assessed: 22 Apr 2020); Sue E. Eckert, "United Nations nonproliferation sanctions," *International Journal*, Winter 2009-2010, pp. 69-83.

## Nuclear Sanctions: Quantitative Analysis

Two sets of multivariate regression analyses were conducted to verify the efficacy of nonproliferation sanctions and the determinants. The first (Model 1-1, 1-2) investigates the correlation between the presence of economic sanctions and military interventions (the independent variables), and the outcomes of 27 nuclear proliferation attempts (the dependent variable).

### [Model 1-1] Sanctions and Military on Nuclear Weapons Possession

| Dependent Variable:<br>Nuclear Weapons Possession Status |             |        |              |
|--|-------------|--------|--------------|
| Independent Variables                                    | Coefficient | S.E.   | Significance |
| Economic Sanctions                                       | 0.3871      | 0.1437 | ***          |
| Military Intervention                                    | -0.3280     | 0.2087 |              |
| Constant   | 0.0699      | 0.0757 |              |

Notes: Significance level parameter are denoted by \*(p < .10), \*\*(p < .05), \*\*\*(p < .01), \*\*\*\*(p < .001)

### [Model 1-2] Sanctions and Military on Nuclear Proliferation Indicator

| Dependent Variable:<br>Nuclear Proliferation Indicator |             |        |              |
|--|-------------|--------|--------------|
| Independent Variables                                  | Coefficient | S.E.   | Significance |
| Economic Sanctions                                     | 0.9677      | 0.2909 | ****         |
| Military Intervention                                  | -0.0699     | 0.4227 |              |
| Constant   | 1.4247      | 0.1533 | ****         |

Notes: Significance level parameter are denoted by \*(p < .10), \*\*(p < .05), \*\*\*(p < .01), \*\*\*\*(p < .001)

Model 1-1 classifies the sanctions' results according to the nuclear proliferation status of each target nation.<sup>45</sup> In contrast, model 1-2 takes a more sophisticated approach of categorizing three developmental phases, according to Singh and Way's "Indicators of Nuclear Proliferation."<sup>46</sup> The "Indicators of Nuclear Proliferation" was adopted to better assess the influence of sanctions and military interventions' influence on the target's proliferation willingness. The models indicate that the use of economic coercion exhibits a positive correlation with nuclear proliferation. This implies that using economic sanctions is not automatically associated with a higher likelihood of counter-proliferation. Rather military interventions were verified to be linked with a higher likelihood of nonproliferation.

Although the initial set of analysis concludes that applying economic coercion on proliferators fails to stop their weapons programs, it does not provide any detailed implications on what conditions attribute to the nonproliferation sanctions' efficacy. To follow up, the research conducts another quantitative analysis to provide a more comprehensive understanding.

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<sup>45</sup> Graham Allison, "Global Challenges of Nuclear Proliferation," in *Nuclear Proliferation: Risk and Responsibility*, ed. Allison et al., A Report to the Trilateral Commission: 60, (2006), pp.3, Figure1-1. (With the update of North Korean nuclear arms acquisition).

<sup>46</sup> Singh and Way, "The Correlates of Nuclear Proliferation: A Quantitative Test," *Journal of Conflict Resolution*, Vol. 48, No. 6, (Dec 2004), pp.865-867. (Again, North Korea updated as "First explosion" phase).

[Model 2-1] Sanction Determinants on Nuclear Weapons Possession

| Dependent Variable:<br>Nuclear Weapons Possession Status                          |             |        |              |
|---|-------------|--------|--------------|
| Independent Variables   | Coefficient | S.E.   | Significance |
| GDP<br>(By \$Billion)   | -0.0007     | 0.0003 |              |
| Economic Interdependence<br>(Import + Export / GDP)                               | -2.6980     | 0.2962 | ***          |
| Multilateral Enforcement<br>(Presence of Multilateral,<br>Institutional Coercion) | -0.1531     | 0.0843 |              |
| Duration of the Sanctions<br>(By Year)  | -0.0156     | 0.0068 |              |
| Proliferation motive<br>(Limited to security<br>/ multiple purposes)              | -0.7276     | 0.1399 | ***          |
| Constant  | 2.5095      | 0.1885 | ****         |

Notes: Significance level parameter are denoted by \*(p < .10), \*\*(p < .05), \*\*\*(p < .01), \*\*\*\*(p < .001)

[Model 2-2] Sanction Determinants on Nuclear Proliferation Indicator

| Dependent Variable:<br>Nuclear Proliferation Indicator                             |             |        |              |
|--|-------------|--------|--------------|
| Independent Variables  | Coefficient | S.E.   | Significance |
| GDP<br>(By \$Billion)  | -0.0010     | 0.0012 |              |
| Economic Interdependence<br>(Import + Export / GDP)                                | -1.8677     | 1.4556 |              |
| Multilateral Enforcement<br>(Presence of Multilateral /<br>Institutional Coercion) | 0.0480      | 0.4145 |              |
| Duration of the Sanctions<br>(By Year)   | -0.0584     | 0.0335 |              |
| Proliferation motive<br>(Limited to security<br>/ multiple purposes)               | -0.2798     | 0.6877 |              |
| Constant   | 4.1580      | 0.9268 | ***          |

Notes: Significance level parameter are denoted by \*(p < .10), \*\*(p < .05), \*\*\*(p < .01), \*\*\*\*(p < .001)

The second group of regressions models verifies the correlation between the nuclear proliferation and the determinants introduced by existing literature on sanctions: target state's economic capacity,<sup>47</sup> target state's dependence on the international economy,<sup>48</sup> multilateral enforcement mechanism,<sup>49</sup> duration of the sanctions,<sup>50</sup> and model of nuclear arms pursuit.<sup>51</sup> To be more specific about the factors, GDP<sup>52</sup> was employed as the standard to gauge the economic size of the targeted nations. For the level of economic interdependence, utilizing the ratio between the target's export / import sum<sup>53</sup> and its GDP was adopted once again from Singh and Way's study,<sup>54</sup> and the duration of the sanctions is measured by year. Lastly, the proliferation motive is whether the motivation source is limited to the external security model. If

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<sup>47</sup> Johan Galtung, "On the effects of International Economics Sanctions: With Examples from the Case of Rhodesia," *World Politics*, Vol. 19, No. 3 (Apr 1967), pp. 378-416.

<sup>48</sup> Kimberly Ann Elliott, "The Sanctions Glass: Half Full or Completely Empty?" *International Security*, Vol. 23, No. 1, (Summer 1998), pp. 50-65.

<sup>49</sup> Johan Galtung, "On the effects of International Economics Sanctions: With Examples from the Case of Rhodesia," *World Politics*, Vol. 19, No. 3 (Apr 1967), pp. 378-416.

<sup>50</sup> Biersteker & Bergeijk, "How and When do Sanctions work? The Evidence," in *On target? EU sanctions as security policy tools*, ed. Dreyer & Luengo-Cabrera, European Union Institute for Security Studies, (2015), pp. 15-28.

<sup>51</sup> Scott D. Sagan, "Why Do States Build Nuclear Weapons: Three Models in Search of a Bomb," *International Security*, Vol. 21, (Winter 1996-1997), No. 3. pp. 57-63.

<sup>52</sup> World Bank, "GDP (Current US\$)," Data, <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD>, (assessed 11 Mar 2020); CIA, "Economy: Korea, North," *The World Factbook*, <https://www.cia.gov/library/publications/the-world-factbook/geos/kn.html>, (assessed 12 Mar 2020); Country Economy, "GDP," Data: Government, <https://countryeconomy.com/gdp>, (assessed 12 Mar 2020).

<sup>53</sup> Barbieri & Keshk, "International Trade: 1870-2014," *Correlates of War Project Trade Data Set Codebook*, Version 4.0, (2016), <https://correlatesofwar.org/data-sets/> (accessed 11 Mar 2020).

<sup>54</sup> Singh & Way, "The Correlates of Nuclear Proliferation," *Journal of Conflict Resolution*, Vol. 48, No. 6, (Dec 2004), pp. 859-885. DOI: 10.1177/0022002704269655.

the proliferator's motive expands further into the domestic politics or norms model according to Sagan's definitions,<sup>55</sup> it is considered as having multiple sources of proliferation motive (Each state's proliferation model displayed in Appendix, [Table 2] "Proliferation motives of States"). The classification of each nation's model status takes advantage of existing academic works on the state's source of nuclear arms proliferation.<sup>56</sup> Other determinants considered to be influential by sanctions scholars: the type of sanctions<sup>57</sup>, regime types,<sup>58</sup> and the phase of development<sup>59</sup> were not included in the calculation due to research restraints. The limitations will be elaborated in the latter portion of the study.

Finally, the second quantitative analysis model utilizes eight historical cases out the list of 27 proliferator states where nuclear nonproliferation sanctions were involved: India (1998), Iran (1999), Iraq (1990), Libya (1979), North Korea (2006), Pakistan (1998), South Africa (1977), and Syria (2005). Like the

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<sup>55</sup> Scott D. Sagan, "Why Do States Build Nuclear Weapons: Three Models in Search of a Bomb," *International Security*, Vol. 21, (Winter 1996-1997), No. 3. pp. 57-63.

<sup>56</sup> Indian, Iranian, North Korean, and Pakistani models were categorized to possess other rationales beyond external security; *Ibid*; Jacques Hymans, "Assessing North Korean Nuclear Intentions and Capacities: A New Approach," *Journal of East Asian Studies*, 8, (2008), pp. 259-292; Peter R. Lavoy, "Nuclear Myths and the Causes of Nuclear Proliferation," *Security Studies*, 2:3-4, (1993), pp. 192-212, DOI: 10.1080/09636419309347524; Etel Solingen, "The Domestic Sources of Nuclear Postures: Influencing 'Fence-sitters' in the Post-Cold War Era," *Institute on Global Conflict and Cooperation Policy Paper 8*, (Oct 1998).

<sup>57</sup> Biersteker & Bergeijk, "How and When do Sanctions work? The Evidence," in *On target? EU sanctions as security policy tools*, ed. Dreyer & Luengo-Cabrera, European Union Institute for Security Studies, (2015), pp. 15-28.

<sup>58</sup> Arthur A. Stein, "Sanctions, inducements, and market power," in *Sanctions Statecraft, and Nuclear Proliferation*, ed. Etel Solingen, Cambridge University Press, (2012), pp. 54-55.

<sup>59</sup> Miyagawa and Ohno, "Nuclear Bombs and Economic Sanctions," *Southern Economic Journal*, Vol. 82, No. 2, (Oct 2015), pp. 635-646.

previous model, the nuclear arms acquisition status is the independent variable for Model 2-1, and the “Indicators of Nuclear Proliferation” is the independent variable for Model 2-2.

Unlike the first model in which both regressions demonstrated similar implications, only Model 2-1 displayed statistically significant outputs. Model 2-1 first shows that the higher level of the target’s economic interdependence on the global market is correlated with the lower chance of nuclear proliferation when economic sanctions are applied. Secondly, the model also demonstrates that the target’s motivation behind its weapons program is limited to the security concerns has a positive correlation with a lower likelihood of its nuclear arms acquisition. Plus, one noticeable outcome from the analyses is that the variables estimated crucial, such as GDP, coercion being multilateral natured, and duration, exhibited statistically insignificant influence on the independent variables.

To summarize, by using multivariate regression analysis on historical records of economic coercion in counter-proliferation issues, the research verifies that the use of sanctions is not correlated with a higher probability of deterring nuclear arms programs. The second set of regression judges that the degree of a target’s integration into the international economy and its sources of proliferation are the most significant determinants. To further analyze the impact of economic interdependence and the proliferation motives, the next portion of this research examines two case studies to verify their significance qualitatively.

## Nuclear Sanctions: Qualitative Analysis

### i) Economic Interdependence

For qualitative analysis of the target's interdependence with the global economy, the research looks into the sanction regimes placed on the DPRK. The DPRK had the one of the lowest trade / GDP ratio of 12.83%<sup>60</sup> as of 2006 when the UN re-initiated sanctions as a response to Pyongyang's clandestine uranium enrichment (HEU) program and 2006 nuclear testing.<sup>61</sup> As the main objective of economic coercion is to alter the target's policy calculation by raising the perceived cost of a nuclear arms program,<sup>62</sup> the target's low level of international economic integration represents lower efficacy by limiting the coercer's lack of leverage over the target's economy. In the case of 2006 North Korea, such implication indicates that the implemented sanctions were only able to influence 12.83% of its market at maximum.

However, the low level of economic interdependence imposes more obstacles to successful sanctions applications than the pure amount of leverage provided in the initial stages. The level of financial liberalization and international integration also affects the perception of interest, thus shaping

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<sup>60</sup> Calculated by the author using: World Bank, "GDP (Current US\$)," Data, <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD>, (assessed 11 Mar 2020); Barbieri & Keshk, "International Trade: 1870-2014," Correlates of War Project Trade Data Set Codebook, Version 4.0, (2016), <https://correlatesofwar.org/data-sets/> (accessed 11 Mar 2020).

<sup>61</sup> Jonathan D. Pollack, "North Korea's Nuclear Weapons Program to 2015," in *Combating Weapons of Mass Destruction*, ed. Busch & Joyner, University of Georgia Press, (2009), pp. 263-280.

<sup>62</sup> Johan Galtung, "On the effects of International Economics Sanctions: With Examples from the Case of Rhodesia," *World Politics*, Vol. 19, No. 3 (Apr 1967), pp. 378-416.

the nuclear posture as a response to the external coercion placed on a proliferating state.<sup>63</sup> Despite DPRK's concentration on the "Military First" diplomacy<sup>64</sup>, there are signs that North Korea's low level of economic interdependence is making itself even more ignorant of the economic damage. Even after the initial economic sanctions in 2006, DPRK's economic interdependence ratio and the absolute amount steadily grew until 2014 and maintained a similar level in 2015.<sup>65</sup>

However, after the 2016 Punggye-ri hydrogen bomb testing and the launch of the Kwangmyongsong-4 satellite, the South Korean government closed the Kaesong industrial complex that represents the economic connection between Seoul and Pyongyang commenting that "assistance and the efforts of our government ... upgrading North Korea's nuclear weapons and long-range missiles".<sup>66</sup> In addition, several new sanctions were imposed on DPRK's economy, including UNSC's resolution 2321 restricting Pyongyang's primary export source, including coal, copper, nickel, silver, and other natural resources.<sup>67</sup> As a result, DPRK's economic interdependence dwindled by

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<sup>63</sup> Etel Solingen, "The Political Economy of Nuclear Restraint," in *Going Nuclear*, ed. Brown et al., MIT Press, (2009), pp. 36-77.

<sup>64</sup> Hoon Suh, "A Study on North Korea's Military-First Diplomacy: From the perspective of a small-weak state's coercive diplomacy towards the US," *The institute of North Korean Studies*, Dongguk University, Vol. 3 (2), (2007), pp.103-147.

<sup>65</sup> Kwan Kyo Lee, "Gross Domestic Product Estimates for North Korea in 2018," Bank of Korea, (Jul 2019); Park and Walsh, "Stopping North Korea, Inc: Sanctions Effectiveness and Unintended Consequences," MIT Security Studies Program, (Aug 2016), pp. 20-22.

<sup>66</sup> Justin McCurry, "Seoul shuts down joint North-South Korea industrial complex," *The Guardian*, (10 Feb 2016), <https://www.theguardian.com/world/2016/feb/10/seoul-shuts-down-joint-north-south-korea-industrial-complex-kaesong>, (accessed 15 Mar 2020).

<sup>67</sup> UN Security Council, "Resolution 2321," S/RES/2321, (2016).

15% in total trade volume and 37.2% in export revenues, inflicting a considerable amount of damage by the use of financial coercion.<sup>68</sup>

Nevertheless, the outcomes were not articulated as expected. After DPRK's dramatic retreat in international commerce, Pyongyang began doubling down its nuclear weapons program. In comparison to its previous history of conducting nuclear-related experiments 2-3 times a year, DPRK conducted five additional testings related to nuclear missile technology just in 2016,<sup>69</sup> including the second Punggye-ri nuclear experiment announced to be successful ballistic missile testing with a mounted nuclear warhead.<sup>70</sup>

Although these aggressive nuclear postures are also the results of diplomatic collisions along with external threats, the effect of North Korea's low engagement in the international economy on its internal decision-making calculation should be accounted for.

Another major obstacle created by the low level of economic integration is the tendency of trade partner concentration. That is, when the target's economic interdependence is relatively small, the nation can seek to minimize

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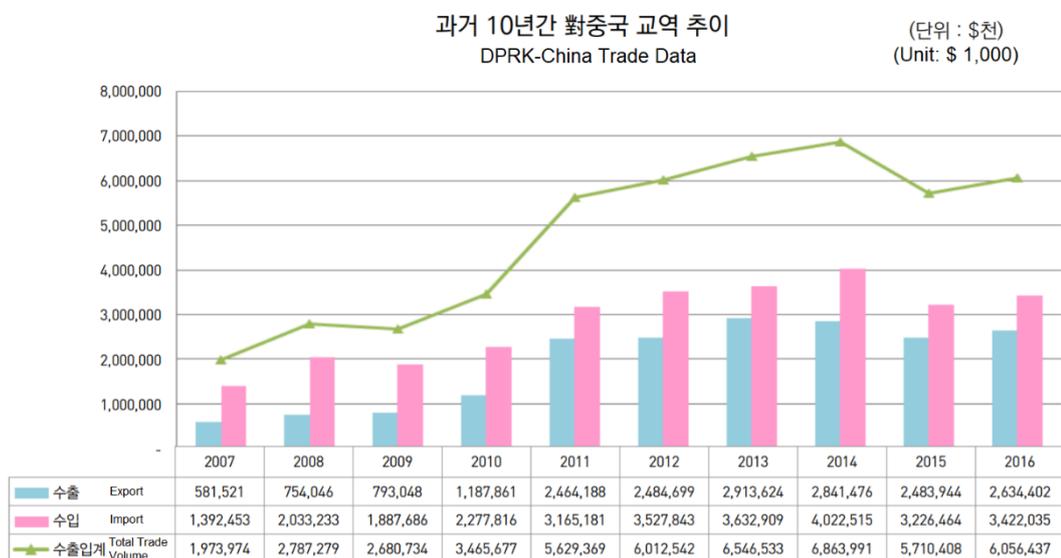
<sup>68</sup> North Korean Economy Watch, "International sanctions to reported to hit DPRK economy harder," (28 Feb 2018); Chang ku Kang, "Gross Domestic Product Estimates for North Korea in 2017," Bank of Korea, (Jul 2018).

<sup>69</sup> BBC, "North Korea tests long-range missile engine," (9 Apr 2016), <https://www.bbc.com/news/world-asia-36002713>, (accessed 13 Mar 2020); Kwon and Cullinane, "US detects failed North Korean ballistic missile launch," CNN (16 Oct 2016), <https://edition.cnn.com/2016/10/15/asia/failed-north-korea-missile-launch/index.html>, (accessed 14 Mar 2020); Sang-hun Choe, "5 Days After Failed Missile Test by North Korea, Another Failure," The New York Times, (19 Oct 2016), <https://www.nytimes.com/2016/10/20/world/asia/north-korea-musudan-missile-failure.html>, (accessed 13 Mar 2020).

<sup>70</sup> Choe, and Perlez, "North Korea Tests a Mightier Nuclear Bomb, Raising Tension," The New York Times, (8 Sep 2016), <https://www.nytimes.com/2016/09/09/world/asia/north-korea-nuclear-test.html>, (accessed 15 Mar 2020).

the inflicted damage by condensing their commerce volume on the partners less affected by the financial coercion, rather than complying with the pressure. As DPRK's economy was interconnected with only a handful number of other states like China and Russia at the time of sanctions application, Pyongyang focused on trading with the partners less complaint of the sanction regime to minimize the economic damage.<sup>71</sup>

[Figure 1] DPRK-China Trade Data<sup>72</sup>

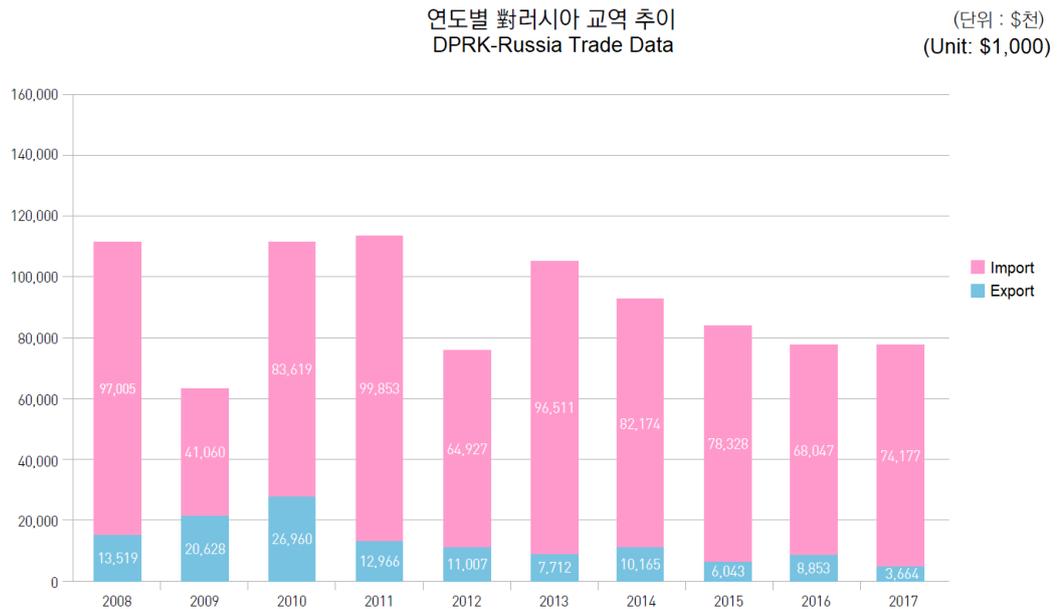


<sup>71</sup> Haggard, and Noland, “Engaging North Korea: the efficacy of sanctions and inducements,” in *Going Nuclear*, ed. Brown et al., MIT Press, (2009), pp. 232-260.

<sup>72</sup> Korea Trade-Investment Promotion Agency (KOTRA), “2016 DPRK Trade Report,” (27 Jul 2017), <http://news.kotra.or.kr/user/globalBbs/kotranews/787/globalBbsDataView.do?setIdx=249&dataIdx=160099&pageViewType=&column=&search=&searchAreaCd=&searchNationCd=&searchTradeCd=&searchStartDate=&searchEndDate=&searchCategoryIdxs=&searchIndustryCatelIdx=&searchItemCode=&searchItemName=&page=1&row=10>.

As observed from Figure 1 above, the amount of trade between North Korea and China increased over time despite the multilateral sanctions and UNSC resolutions enacted in 2006. Russia is another state mostly unaffected by the counter-proliferation sanctions on DPRK. Russia is second to only China when it comes to the trade volume with the DPRK. Although Figure 2 demonstrates a steady decrease over time, the DPRK-Russia trade volume remained constant.

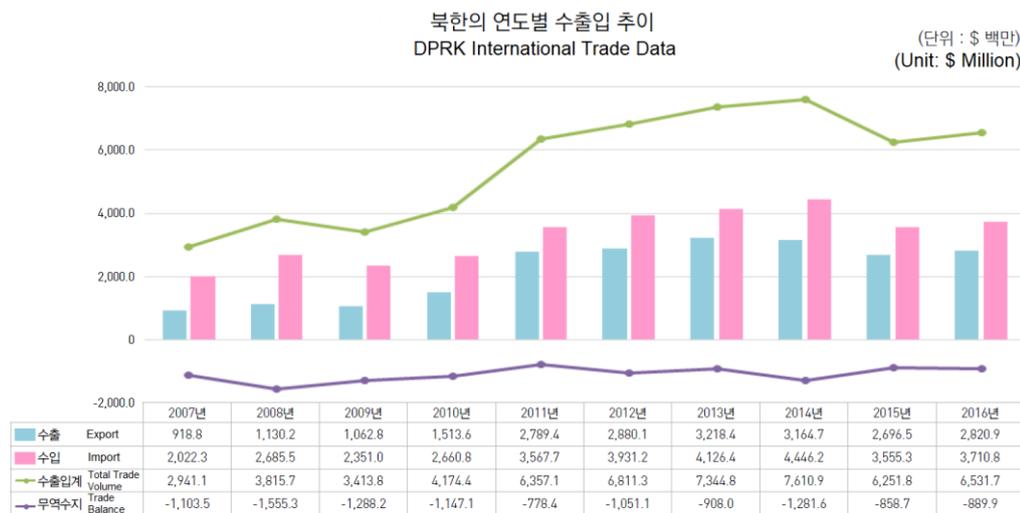
[Figure 2] DPRK-Russia Trade Data<sup>73</sup>



<sup>73</sup> KOTRA, "2017 DPRK Trade Report," (18 Jul 2018), <http://news.kotra.or.kr/user/globalBbs/kotranews/787/globalBbsDataView.do?setIdx=249&dataIdx=168031&pageViewType=&column=&search=&searchAreaCd=&searchNationCd=&searchTradeCd=&searchStartDate=&searchEndDate=&searchCategoryIdxs=&searchIndustryCatIdx=&searchItemCode=&searchItemName=&page=1&row=10>.

Finally, Figure 3 shows DPRK's total global trade volume over ten years, beginning in the year 2007 when the international nonproliferation sanctions initiated. Not only does the data represent an overall increase in North Korean commerce activity, but it also displays a nearly identical trend to Figure 1, DPRK-China trade data. Such implication suggests that DPRK's concentration on the invulnerable partners, led other economic exchanges negligible, significantly undermining the influence of financial nonproliferation efforts.

[Figure 3] DPRK International Trade Data<sup>74</sup>



In the end, the above data demonstrate the North Korea's low economic connectivity damaging the efficacy of the nonproliferation sanctions in two

<sup>74</sup> KOTRA, "2016 DPRK Trade Report," (27 Jul 2017), <http://news.kotra.or.kr/user/globalBbs/kotranews/787/globalBbsDataView.do?setIdx=249&dataIdx=160099&pageViewType=&column=&search=&searchAreaCd=&searchNationCd=&searchTradeCd=&searchStartDate=&searchEndDate=&searchCategoryIdxs=&searchIndustryCatelIdx=&searchItemCode=&searchItemName=&page=1&row=10>.

ways. First, by driving the Pyongyang's decision-makers ignorant of the financial losses, and second, by incentivizing DPRK to concentrate their remaining international trade volume on the states less influenced by the sanctions regime. Although these two mechanisms may not operate the same way in every instance of proliferation, they illustrate the process of how the low level of economic interdependence undermines the efficacy of counter-proliferation sanctions.

## ii) Proliferation Motive

The proliferation motives are other core variables in explaining the interaction between economic sanctions and counter-proliferation. The perceived existence of a significant external threat is a prerequisite condition for a nuclear arms program.<sup>75</sup> Every state's pursuit of the atomic weapon began with the belief that the acquisition of this strategic arm will guarantee its vital interests in the anarchical international system. Be it Stockholm and Bern calculating ways to secure their holdings in the European continent, or Islamabad and Tehran pursuing to offset regional rivals' nuclear advantage, the political consideration of going nuclear is born out of some level of security concerns.

However, not all the states that have considered nuclear arms alternative end up acquiring atomic weapons. Factors other than external threats must reinforce the decision to proliferate for the program to achieve its goal. In this sense, the expansion of proliferation into internal political and normative sources can severely impair the efficacy of nonproliferation sanctions. The domestic politics model supports the state's proliferation by having influential figures in science, security, and political sectors believe that nuclear weapons will promote their interest.<sup>76</sup> On the other hand, the norms model does so by anchoring the belief that going nuclear is a rational behavior according to the

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<sup>75</sup> Monteiro & Debs, "The Strategic Logic of Nuclear Proliferation," *International Security*, Vol. 39, No. 2, (Fall 2014), pp.7-51, doi:10.11192/ISEC\_a\_00177.

<sup>76</sup> Scott D. Sagan, "Why Do States Build Nuclear Weapons: Three Models in Search of a Bomb," *International Security*, Vol. 21, (Winter 1996-1997), No. 3. pp. 54-86.

state's national identity, into the public and the leadership.<sup>77</sup>

The proliferation of India illustrates how the domestic political source of proliferation contributes to the state's higher willingness to possess nuclear arms. Multiple pieces of evidence support the Indian politicians' and scientists' internal influence in the Indian proliferation process. To begin with, India's regional nuclear threat, the 1964 Chinese nuclear test, did not result in an immediate response nor consensus within New Delhi. Instead, there were constant bureaucratic struggles between those in favor of the weapons program, namely Homi Bhabha, the head of Atomic Energy Commission (AEC), and those against it, such as Prime Minister Shastri.<sup>78</sup> Notably, Prime Minister Shastri was skeptical of the nuclear development's practical value because he expected its cost to be overly burdensome for the Indian economy. Nevertheless, AEC's continuous lobbying on the pro-nuclear party in Congress pressured the Indian government to pursue a secret atomic weapons project, though the decision was renounced shortly.<sup>79</sup> A few years later, in the early 1970s, AEC's leadership once again reached out to Gandhi, the Indian Prime Minister at the time, whose administration was suffering from internal turmoil and lack of domestic support. Seeing this as an opportunity to bolster the public support,<sup>80</sup> she approved the 'Peaceful Nuclear Explosion'

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<sup>77</sup> Ibid.

<sup>78</sup> Scott D. Sagan, "Why Do States Build Nuclear Weapons: Three Models in Search of a Bomb," *International Security*, Vol. 21, (Winter 1996-1997), No. 3. pp. 65-69.

<sup>79</sup> Shyam Bhatia, "India's Nuclear Bomb," Ghaziabad: Vikas Publishing House, (1979), pp. 120-122

<sup>80</sup> Leonardo S. Milani, "Comparing India and Pakistan's Nuclear Proliferation Policies During

claimed by AEC. By providing the Indian public with a nationalist political consensus, the explosion contributed to Gandhi and the ruling party's recovery in support immediately.<sup>81</sup>

The North Korean case specifically shows non-security sources of proliferation undermining the impact of sanctions. Two of the most influential political and bureaucratic groups in the DPRK, the Korean Workers Party (KWP) and the National Defense Commission (later replaced by State Affairs Commission), have the most significant influence over the missile development and at the same time benefit the most out of it.<sup>82</sup> Specifically, the nuclear arms acquisition profits the North Korean leadership in terms of generating nationalistic prestige that connects to enhanced domestic support on the regime, not to mention its security guarantee against external threats.<sup>83</sup> In this sense, some scholars suggest that counter-proliferation sanctions may even allow the target to blame the coercers of domestic suffering.<sup>84</sup> Such 'rally round the flag' sentiments can be detrimental to the efficacy of the sanctions because it lowers the political cost of proliferation when the very objective of the sanction is to change the target's behavior through raising its

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the Cold War," *E-International Relations*, (Nov 2011), pp.3, ISSN 2053-8626.

<sup>81</sup> Scott D. Sagan, "Why Do States Build Nuclear Weapons: Three Models in Search of a Bomb," *International Security*, Vol. 21, (Winter 1996-1997), No. 3. pp. 65-69.

<sup>82</sup> Danial A. Pinkston, "Domestic Politics and Stakeholders in the North Korean Missile Development Program," *The Nonproliferation Review*, (Summer 2003), pp. 1-15.

<sup>83</sup> *Ibid*, pp. 1-5.

<sup>84</sup> Kevin Gray, "Sanctions on North Korea are Counterproductive," *Just Security*, (26 Nov 2019), accessed 15 Mar 2020, <https://www.justsecurity.org/67473/sanctions-on-north-korea-are-counterproductive/>.

cost.

Moreover, Kim's regime (including previous Kim Il Sung and Kim Jong Il) fall under the "Oppositional nationalist," according to Hyman's NIC concept.<sup>85</sup>

This indicates that fear and pride are what drives the North Korean leadership to pursue nuclear weapons as their natural response to relieve the anxiety and assure autonomy.<sup>86</sup> Likewise, all three leaders of the DPRK have constantly indoctrinated the North Korean public through the ideology of 'Juche' (Self-Reliance) and 'Kangsongdaeguk' (Powerful State).<sup>87</sup> These attempts anchor the "Oppositional nationalist" beliefs that justify their nuclear development, reducing the domestic unrest, even when the economic damages from nonproliferation sanctions are significant.<sup>88</sup>

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<sup>85</sup> Hyman's NIC concept is explained in the literature review section of this research; Jacques E. C. Hymans, "The Psychology of Nuclear Proliferation: Identity, Emotions, and Foreign Policy," Cambridge University Press, (2006).

<sup>86</sup> Jacques E. C. Hymans, "Assessing North Korean Nuclear Intentions and Capacities: A New Approach," *Journal of East Asian Studies*, 8, (2008), pp. 259-292.

<sup>87</sup> Chrisy Lee, "As North Korea Reverts to Self-Reliance, Expert urge Pressuring Elites," VOA, (27 Jan 2020), <https://www.voanews.com/east-asia-pacific/north-korea-reverts-self-reliance-experts-urge-pressuring-elites>, (accessed 17 Mar 2020); Danial A. Pinkston, "Domestic Politics and Stakeholders in the North Korean Missile Development Program," *The Nonproliferation Review*, (Summer 2003), pp. 10-11.

<sup>88</sup> Johan Galtung claims that the purpose of sanction is to cause adequate economic damage which results economic / political disintegration, and later political instability. He argues that this political instability is what makes the target government comply with the economic coercion; Johan Galtung, "On the effects of International Economics Sanctions: With Examples from the Case of Rhodesia," *World Politics*, Vol. 19, No. 3 (Apr 1967), pp. 378-416.

## **Results and Discussion**

The results of this research indicate that the target's level of economic interdependence and its sources of proliferation are the most significant determinants of the success of counter-proliferation sanctions. Such findings do not match with the hypothesis of this study, with only two of the original determinants proven statistically significant. To contribute to the existing nuclear sanctions discussion, this study first assembles the prominent contributing factors from existing pieces of literature on nuclear proliferation and economic coercion. Then, the study empirically verifies them, using both quantitative and qualitative research methods.

For a detailed view of the results, the lower level of economic interdependence diminishes the efficacy of the nonproliferation sanctions by limiting its range of influence and shaping the decision-making actors to be less influenced by economic measures. Thus, the lower dependence on the global market also enables the target to concentrate its connections on partners less affected by the imposed set of sanctions, when economic coercion is applied. Similarly, the diversification of the proliferation motivations undermines the impact of sanctions by lowering the political damage (social unrest) caused by the economic pressure or even taking advantage of the coercion to gain political integration by taking advantage of the domestic political and normative supports for nuclear proliferation.

## Conclusion

As a response to the prevalent skepticism over economic sanction's efficacy, many scholars suggested conditions in which the financial coercions can operate more successfully. However, since nuclear proliferation is a realm with a high level of uncertainty and extremity, the research intended to empirically verify what the determinants with significant influence are when the sanctions are intended for counter-proliferation. Through the quantitative and qualitative analysis, the author was able to find that the target state's lower degree of economic interdependence and diverse source of nuclear intentions undermine the efficacy of sanctions, contributing to a lower probability of successful nuclear sanctions regime.

Because such factors are demand-side variables, there are not many conventional options for the US or the international society to ensure the effectiveness of nuclear sanctions, aside from selecting targets with favorable conditions in terms of interdependence and its proliferation rationale. However, if there is to be an actionable policy suggestion from this research, there are two implications. First, keep potential proliferators engaged in international commerce with diverse trade partners, especially with pro-liberalist actors. Estimating the next generation of potential proliferators from the geopolitical conditions and maintaining their global economic connectivity can drive the target's domestic actors toward liberalism, as well as guarantee the efficacy of the financial coercions when they are applied. Second, remind the international community of the fact that exercising comprehensive sanctions immediately on a new proliferator may reinforce their nuclear arms

decision by raising their domestic support. To prevent the undesired consequences, the coercer must always assess the possible amount of political disintegration brought about by the financial measure, in addition to what aspect of the receiver should be targeted to cause the political instability.

Finally, although the research strived to fill in the gap of counter-proliferation sanctions, there still exist several limitations to this study. The first limitation of this research is that it does not account for several influential determinants among the sanction scholars. The variables not explained in the study are the regime types, type of sanctions, and the phase of development. Target's regime type is not included in the analysis because most nations under nuclear sanctions are autocratic, undermining the validity of the statistical analysis. The type of sanctions and the phase of development were discarded due to the difficulty of defining the sub-categories while adhering to the theme of this research. For instance, a nuclear sanctions regime typically combines targeted sanctions on core interest groups and comprehensive sanctions on the receiver's industry, thus gauging the efficacy of each measure requires separate research on its own.

The influence of a hegemonic supporter is another limitation of this research. The presence of hegemonic power supporting the sanctioned target has an immense interactive effect on the relationship between the dependent variables (determinants), and the independent variable (outcomes of nuclear sanction). Typically, determinants involving the international system such as 'multilateral pressure' and 'economic interdependence' display different levels of validity and significance depending on the presence of hegemonic

supporters. However, because defining the amount of hegemonic engagement does not belong within the scope of this study,<sup>89</sup> the study of this interactive relationship between the presence of hegemonic support and other determinants is left for future research.

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<sup>89</sup> Such consideration includes: how much investment from a hegemon should be the standard of being involved? How to assess political and diplomatic supports? Can the hegemonic influence be isolated from other variables? Etc.

## Appendix

[Table 1]

| Five Determinants Explained |   |  |  |
|-----------------------------|---|--|--|
| Determinants                | Definition  | Scale  | Related Study  |
| Economic Capacity           | Sanction target's economic size in quantitative scale                             | GDP  | Johan Galtung, "On the effects of International Economics Sanctions: With Examples from the Case of Rhodesia," <i>World Politics</i> , Vol. 19, No. 3 (Apr 1967), pp. 378-416. |
| Economic Interdependence    | Sanction target's connectivity to the international economy in quantitative scale | Import + Export / GDP                                  | Singh and Way, "The Correlates of Nuclear Proliferation: A Quantitative Test," <i>Journal of Conflict Resolution</i> , Vol. 48, No. 6, (Dec 2004), pp.865-867.                 |
| Multilateral Coercion       | Whether the sanctions regime is applied by multiple nations or a single nation    | Multilateral or unilateral                             | Johan Galtung, "On the effects of International Economics Sanctions: With Examples from the Case of Rhodesia," <i>World Politics</i> , Vol. 19, No. 3 (Apr 1967), pp. 378-416. |
| Duration                    | The duration of the sanction  | Year   |  |
| Proliferation motives       | Target's source of motivation behind the nuclear proliferation                    | Limited to security concerns or includes other motives | Scott D. Sagan, "Why Do States Build Nuclear Weapons: Three Models in Search of a Bomb," <i>International Security</i> , Vol. 21, (Winter 1996-1997), No. 3. pp. 54-86.        |

**[Table 2]**

| <b>Proliferation motives of States</b> |  |
|--|--|
| <b>State</b>                           | <b>Proliferation Models (According to Sagan's framework)</b> |
| India                                  | Security / Domestic Politics / Normative Model               |
| Iran                                   | Security / Normative Model                                   |
| Iraq                                   | Security Model   |
| Libya                                  | Security Model   |
| North Korea                            | Security / Domestic Politics / Normative Model               |
| Pakistan                               | Security / Normative Model                                   |
| Syria                                  | Security Model   |
| South Africa                           | Security Model   |

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