UNIVERSITETI I EJL

FAKULTETI JURIDIK

УНИВЕРЗИТЕТ НА ЈИЕ

ПРАВЕН ФАКУЛТЕТ

SEE UNIVERSITY

LAW FACULTY

"THE GEOPOLITICAL PHENOMENOLOGY OF NUCLEAR-BASED STATE TERRORISM: AN ANALYTICAL-LEGAL APPROACH"

Candidate:

Stefani Stojchevska

Mentor:

Prof. Dr. Bekim Nuhija

Tetovo, 2021

TABLE OF CONTENT

ABSTRACT

The conceptualization of “Nuclear-Based State Terrorism (NBST)” as a new embodiment regarding international crimes against peace and humanity is established and, to a great extent, developed within this Master’s thesis. In correspondence, two types of NBST demonstrations are distinguished – transnational and domestic. While a multidisciplinary approach is comprehensively manifested, adopted research methods include two simple linear regression analyses. Based on observations derived from both regression analyses, respective mathematical models for predicting NBST, as well as for measuring national and military power under circumstances of NBST conduct are presented. The geopolitical phenomenology of NBST, all in all, aims to raise mankind’s awareness of currently living in a “nuclear-civilized” society.

Keywords: Nuclear Weapons; Radioactive Material; State Terrorism; Simple Linear Regression Analysis; Mathematical Models;

АПСТРАКТ

Концептуализацијата на “Нуклеарно-Базиран Државен Тероризам (НБДТ)” како ново олицетворение во однос на меѓународните злосторства против мирот и човештвото е воспоставена и, во голема мера, развиена во рамките на оваа магистерска теза. Во кореспонденција, се разликуваат два типа на демонстрации на НБДТ – транснационален и домашен. Додека мултидисциплинарен пристап е сеопфатно манифестиран, усвоените истражувачки методи вклучуваат две анализи на едноставна линеарна регресија. Врз основа на обсервациите добиени од двете анализи на линерна регресија, соодветни математички модели за предвидување НБДТ, како и за мерење на националната и воената моќ под околности на спроведен НБДТ се преставени. Геополитичката феноменологија на НБДТ, сè на сè, има за цел да ја подигне свеста на човештвото дека моментално живее во “нуклеарно-цивилизирано” општество.

Клучни зборови: Нуклеарно Оружје; Радиоактивен Материјал; Државен Тероризам; Анализа на Едноставна Линеарна Регресија; Математички модели;

ABSTRAKT

Konceptualizimi i “Terrorizmit Shtetëror në Baza Nukleare (TSBN)” si një koncept i ri në lidhje me krimet ndërkombëtare kundër paqës dhe njerëzimit është krijuar dhe në një masë të madhe është zhvilluar në kuadër të kësaj teze së magjistraturës. Në korrespondencë, dallohen dy lloje të demonstrimeve TSBN - ajo transnacionale dhe nacionale. Deri sa qasja multidisiplinare manifestohet në mënyrë gjithëpërfshirëse, metodat e miratuara të kërkimit përfshijnë dy analiza të thjeshta të regresionit linear. Bazuar në vëzhgimet e nxjerra nga të dyja analizat e regresionit, janë paraqitur modelet përkatëse matematikore për parashikimin e TSBN-së, si dhe matjen e fuqisë kombëtare dhe ushtarake në rrethanat e sjelljes së TSBN-së. Fenomenologjia gjeopolitike e TSBN, në përgjithësi, synon të rrisë ndërgjegjësimin e njerëzimit për të jetuar aktualisht në një shoqëri "të civilizuar bërthamore".

Fjalë kyçe: Armët Bërthamore; Material radioaktiv; Terrorizmi Shtetëror; Analiza e thjeshtë e regresionit linear; Modele Matematikore;

PREFACE

"*The unleashed power of the atom has changed everything save our modes of thinking and we thus drift toward unparalleled catastrophe*" – Albert Einstein, 1946

In a world where nuclear weapons are continuously proliferated and international treaties aimed toward their prohibition are being turned a blind eye to by NWS and NNWS demonstrating serious nuclear aspirations, we must comprehend that it is, unfortunately, never too late for governments to bring forward new embodiments of international crimes against peace and humanity. On that account, the conceptualization of "Nuclear-Based State Terrorism" as a simultaneous political and psychological weapon is presented. By being possibly designated as the most destructive manifestation of state terrorism, this Master's thesis summarizes its geopolitical phenomenology by amalgamating multiple scientific methods, primarily those of mathematical logistics. The enthusiasm for this scientific research was inaugurated by asseverations of theoretical physicist Albert Einstein related to nuclear weapons, where violent means of obtaining national and military power within the range of the currently ongoing nuclear arms race postulate that international politics are indeed more difficult to wrap one's mind around rather than nuclear physics regarding this instance. Yet, as a young scientist myself, having establishing and, to a great extent, further developing "Nuclear-Based State Terrorism" was not particularly challenging in a necessary manner. On the contrary, what drove me to push the limits of what is ordinarily anticipated, was my belief that raising our awareness of living in a "nuclear-civilized" society is crucial in addressing prospective NBST repercussions which could fundamentally change the course of humanity.

Tetovo, November 2021

Stefani Stojchevska

Chapter I: A Historical Overview of Nuclear Weapons Proliferation regarding Nuclear-Weapons States [1945-2021]

I.I. The Influence of the Cold War upon the Evolution of Nuclear Weapons Stockpiles

The twenty-five year period after the Second World War, then, had abundant themes, of which the bipolar geopolitical confrontation was just one, and certainly not the key to all others. However, in one respect the cold war did leave a major imprint on the contemporary history: The development of nuclear technology and armament. The US-USSR confrontation was of grave seriousness to the whole of humankind because the superpowers chose to acquire huge arsenals of nuclear weapons that threatened to destroy the entire world, human civilization, and the natural habitat.[1] During the Cold War and with the advent of nuclear weapons, the superpowers attempted to maintain peace more by dissuading an attack by threatening painful retaliation than by preparing to defend against an attack after it had occurred. Cold War deterrence depended upon the maintenance of large nuclear arsenals, but it was also an extension of balance-of-power logic. Deterrence by nuclear threat was one way each superpower tried to prevent the other from gaining advantage and hence upsetting the balance of power between them.[2] At present, the U.S. nuclear weapons stockpile is a legacy of the Cold War, in a manner that U.S. weapons were designed to hold Soviet targets at risk and, to reduce costs, were highly optimized to deliver the maximum amount of yield for the minimum weight. They were designed to remain in the stockpile for a fixed period of time and then to be replaced with fresh units. Today, the requirements for weapons are much different. The geopolitical situation has changed fundamentally since the end of the Cold War and new technologies have arisen that can perform some of the missions formerly assigned to nuclear weapons. Thus the requirements for nuclear weapons, both their type and number, have

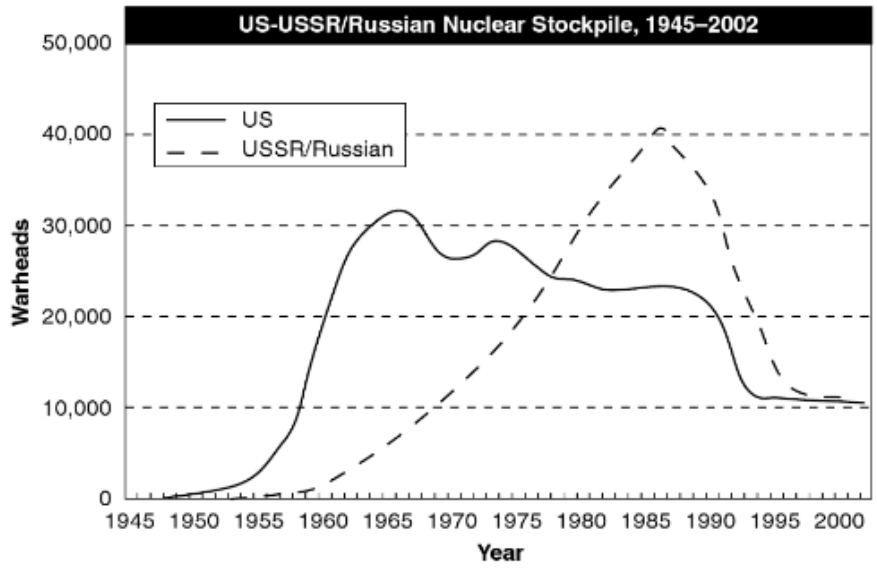
[1] Immerman, Richard H., and Goedde, Petra, *The Oxford Handbook of the Cold War,* Oxford University Press, 2013, p.21.

[2] Nye, Joseph S., and Welch, David A, *Understanding Global Conflict and Cooperation: Intro to Theory and History*, New York, Pearson, 2014, p.150.

changed.[3] We notice the temporal gap between US-USSR/Russian Nuclear Stockpile in terms of their highest points in Table 1, where the U.S. reached its highest point with slightly more than 30,000 warheads during the period of 1965 but continued to decrease afterwards. On the other hand, the USSR/Russia reached its highest point with around 40,000 warheads primarily after 1985 but also continued to dramatically decrease during the following years, becoming equated with the U.S. The difference regarding the highest points between U.S.-USSR/Russia is roughly 20 years, taking into account 1965 (U.S.) and 1985 (USSR/Russia).

Table 1: US-USSR/Russian Nuclear Stockpile, 1945-2002

Nuclear weapons and the escalation of the Cold War, 1945–1962



Note. Adapted from "The Cambridge History of the Cold War: Volume 1" (p.389), by M.P. Leffler & O.A. Westard, 2010, Cambridge: Cambridge University Press.

We additionally notice an accurate statistical correspondence between Table 1 and official governmental data. Despite official claims of full control of the nuclear arsenal, the exact number of warheads that were produced and deployed in the FSU (former Soviet Union) remains shrouded in secrecy and therefore a matter of estimation. The most reliable estimates,

[3] United States Congress, *Nuclear Weapons Complex Modernization: Hearing Before the Strategic Forces Subcommittee of the Committee on Armed Services, House of Representatives, One Hundred Tenth Congress, Second Session, Hearing Held July 17, 2008,* Washington, U.S. Government Printing Office, 2009, p.217.

based on data from the US Central Intelligence Agency (CIA) and the Russian Ministry for Atomic Energy (Minatom), credit the FSU with some 32,000 nuclear warheads in the mid-1993, of which 15 000 are active, or deployed, and 17 000 are in storage or awaiting disassembly and disposal. Warheads built between 1949 and 1992 total 55 000, and the inventory peak year being 1986 when the Soviet active stockpile reportedly contained 45 000 warheads. In comparison, in the mid-1993 USA retained some 16 500 warheads, 6000 of which were awaiting disassembly. The total number of US warheads built between 1945 and 1992 has been estimated at 70 000, the inventory peak being 1967 with 32 500 nuclear warheads in the US active stockpile.[4]

Table 2: Strategic Nuclear Weapons of the Former Soviet Union outside Russia, as of late 1994

Country	Delivery vehicles	Designation	Number Weapons	Warheads[a]
Ukraine	ICBM	SS-19	130	(660)
	ICBM	SS-24	46	(280)
	Bomber	Bear-H6	7	42
	Bomber	Bear-H16	14	224
	Bomber	Blackjack	19	228
Total				**1 374**
Kazakhstan	ICBM	SS-18	92	920
Belarus	ICBM	SS-25	36	36
Total				**2 330**

Note. Adapted from "The Soviet Nuclear Weapon Legacy" (p.7), by M. De Andreis & F. Calogero, 1995, Oxford: Oxford University Press.

In continuation, Table 2 displays precise statistical data regarding the countries outside of the Russian republic, where approaching the end of 1994 (which is approximately the time period when both the U.S. and USSR/Russia have started to reach their lowest points in terms of the amounts of nuclear stockpile), Ukraine possessed 1374 warheads in total, while the addition of

[4] De Andreis, Marco and Calogero, Francesco, *The Soviet Nuclear Weapon Legacy*, Oxford University Press, 1995, p.3.

956 warheads possessed by both Kazakhstan and Belarus, managed to dramatically increase the amount of 2330 nuclear warheads in total, thus strengthening the risk of nuclear terrorism. Since the collapse of the Soviet Union, some Western security experts have been warning that it is only a matter of time before "loose nukes" in Russia fall into the hands of nuclear terrorists.[5] In correspondence, concerns by prominent U.S. scholars and officials have been proclaimed toward the Soviet Union and the international security environment in general. Ashton B. Carter, Director at the Center for Science and International Affairs at Harvard Kennedy School, had stated:

> *"While it has important technical features, Soviet nuclear command and control is at root a social and political creation. It cannot stand completely apart from turmoil in the society in which it is embedded. And even if one-hundredth of one percent of the nuclear weapons in the Soviet stockpile falls into the wrong hands, destruction greater than the world has seen Hiroshima and Nagasaki could result... The destiny of the 27,000 nuclear weapons on the territory of the former Soviet Union is therefore a paramount concern."*[6]

Further expressions of such interests from the American side, were manifested by the statement of Thomas P. D'Agostino, Under Secretary for Nuclear Security and Administrator at the National Nuclear Security Administration:

> *"Our future deterrent won't be based on the Cold War model of a large number of weapons. The Cold War model is not appropriate to address the 21st Century international security environment. We are reducing the size of our nuclear weapons stockpile. Instead, it will be based upon the* ***capability*** *and* ***flexibility*** *to respond to varying national security situations and produce those weapons if and when required."*[7]

---

[5] Kamp, Karl-Heinz, "An Overrated Nightmare". *Bulletin of Atomic Scientists.* Vol.52, no.4, 1996: 30.

[6] United States Congress, *Preventing Chaos in the Former Soviet Union: The Debate on Providing Aid: Report of the Committee on Armed Services, House of Representatives, One Hundred Second Congress, Second Session, Volume 4,* Washington, U.S. Government Printing Office, 1992, p.242.

[7] United States Congress, *Nuclear Weapons Complex Modernization: Hearing Before the Strategic Forces Subcommittee of the Committee on Armed Services, House of Representatives, One Hundred Tenth Congress, Second Session, Hearing Held July 17, 2008,* Washington, U.S. Government Printing Office, 2009, p.7.

Regarding the development of U.S. nuclear weapons policy, the first Strategic Arms Reduction Treaty (START I) signed in 1991 as the Cold War was ending and now being implemented by both the United States and Russia, will reduce the number of strategic nuclear warheads deployed by the two countries from 13,000 and 11,000, respectively, to about 8,000 each. START II, signed in 1993 and ratified by the United States in early 1996 but not yet ratified by Russia, would further limit the number of deployed strategic warheads to 3,000 to 3,500 on each side.[8] On the other hand, the new START Treaty, signed in 2010 corresponds to such objectives, yet while the New START Treaty represents a substantial decrease from Cold War levels, the United States will retain around 2,000 deployed strategic and tactical nuclear weapons and Russia will maintain approximately 3,500 deployed strategic and tactical nuclear weapons – which together will constitute over 90 percent of world's nuclear weapons.[9]

I.II. The Emergence of New Nuclear-Weapons States

Concerned with the prospects of more states acquiring nuclear weapons by the United States and the former USSR agreed to negotiate a legally bilateral arrangement that could limit the number of nuclear weapons states and prevent further proliferation of nuclear technology. The resultant treaty that came out in the form of NPT was seen as *"a hegemonic Cold War exercise between the United States and the Soviet Union,"* since it preserved the advantages of both nuclear possessor states while denying similar privileges to the rest of the world. Despite these very early efforts to prevent other countries from acquiring nuclear weapon technology, three additional states – Great Britain, France, and China – formally declared their nuclear status before the start of negotiations toward the NPT.[10] As displayed in Table 3, we notice the evolution of nuclear warheads in the inventory of the five nuclear-weapons states (NWS), from 1945 to 2014, where both the highest and lowest points of each nuclear possessor state manifest a specific temporal gap by years:

[8] National Academy of Sciences, *The Future of U.S. Nuclear Weapons Policy*. Washington, National Academies Press, 1997, p.1.

[9] Zenko, Micah, *Toward Deeper Reductions in U.S. and Russian Nuclear Weapons*, New York, Council of Foreign Relations, 2010, Introduction, para.1.

[10] Sultan, Adil, *Universalizing Nuclear Nonproliferation Norms: A Regional Framework for the South Asian Nuclear Weapon States*, Cham, Springer, 2018, p.27.

- Regarding the **U.S.**, the difference between the highest point (1965) and the lowest point (1945) of the number of nuclear warheads is 20 years;
- Regarding the **USSR/Russia**, the difference between the highest point (1986) and the lowest point (1945) of the number of nuclear warheads is 40 years;
- Regarding **Britain**, the difference between the highest point (1980) and the lowest point (1945) of the number of nuclear warheads is 35 years;
- Regarding **France**, the difference between the highest point (1990) and the lowest point (1945) of the number of nuclear warheads is 45 years;
- Regarding **China**, the difference between the highest point (1990) and the lowest point (1945) of the number of nuclear warheads is 45 years;

Table 3: Number of Nuclear Warheads in the Inventory of the five NWS, 1945-2014

Year	*US*	*USSR/Russia*	*Britain*	*France*	*China*	*Total*
1945	6	0	0	0	0	6
1950	369	5	0	0	0	374
1955	3 057	200	10	0	0	3,267
1960	20,434	1,605	30	0	0	22,069
1965	31,982	6,129	310	32	5	38,458
1970	26,662	11,643	280	36	75	38,696
1975	27,826	19,055	350	188	185	47,604
1980	24,304	30,062	350	250	280	55,246
1986*	24,401	45,000	300	355	425	70,481
1990	21,004	37,000	300	505	430	59,239
1995	12,144	27,000	300	500	400	40,344
2000	10,577	21,000	185	470	400	32,632
2005	10.295	17,000	200	350	400	28,245
2010	8,500	11,000	225	300	240	20,265
2014	7,300	8,000	225	300	250	16,075

Note. Adapted from "Nuclear Weapons and International Security: Collected Essays" (p.3), by R. Takhur, 2015, New York, NY: Routledge.

According to this brief analysis, the U.S. had the shortest span between the contrasting points, while the other nuclear possessor states' span ultimately varied from 5 to 10 years. Among the three additional nuclear possessor states, Britain manifested more significant advancements in terms of the amount of nuclear warheads in comparison to France and China, which both

manifested approximate advancements without drastic differences between them and even share the same span between the contrasting points of 45 years. This gives us an accurate perception of the national power of these five countries in terms of nuclear weapons. However, another related question that simultaneously emerges is: *"what are the costs of nuclear weapons?"* An overview of national expenditures on strategic nuclear forces since 1970 is presented in Table 4, where statistics act in accordance with heterogeneous documentations and are further sufficed over the temporal interval of two decades concerning ephemeral oscillatory concessions.

Table 4: Estimated Average Annual Expenditure on Strategic Nuclear Forces, 1970-90

	Share of defence procurement (%)	Share of total defence expenditure (%)
USA	14	11
USSR	18–25	15–18
Britain	12	7
France	32	21
China	20–25	12–15

Note. Adapted from "Security without Nuclear Weapons?: Different Perspectives on Non-nuclear Security" (p.62), R.C. Karp, 1992, Oxford: Oxford University Press.

Focusing on a more specific aspect, within the U.S. nuclear weapons manufactured and delivered each year are valued by the Atomic Energy Commission (AEC) at the standard cost established for each unit, adjusted for a part of the total cost variance reported by all production contractors. Each weapon production contractor develops standard costs annually for the parts scheduled to be manufactured for new weapons. Standard costs of each part consist of direct labor costs, direct material costs, and indirect costs.[11] Program objectives in FY 1973 require operating fund increases in production and research and development activities. The FY 1973 request of $877.7 million is an increase of $34.9 million over the FY 1972 level.[12]

[11] Joint Committee on Atomic Energy, *Hearings and Reports on Atomic Energy, Volume 159*, Washington, U.S. Government Printing Office, 1972, p.3142.

[12] Joint Committee on Atomic Energy, *Hearings and Reports on Atomic Energy, Volume 159*, Washington, U.S. Government Printing Office, 1972, p.2472.

Moreover, regarding the aspects of ***Research and Development***, the fulfillment of the Atomic Energy Commission's responsibility to develop new nuclear warheads to meet national defense requirements is contingent upon the availability of modern nuclear research and development weapons laboratories. During the beginning of the 1970s, the weapons program laboratories have realized substantial manpower reductions. The proposed program of $263.4 million, an increase of $15.7 million above the FY 1972 level, provides for a continuation of about the same level of effort to meet the, then present, weaponization requirements, surveillance of weapons currently in stockpile to ensure their reliability, and within the constraints of the remaining resources, to permit a level of effort for advanced weapon development with the objective of ensuring U.S. capability to meet weaponization requirements of future years.[13]

Table 5: The FY 1973 Authorization Request for the Weapons Program of the AEC

	In millions
Operating costs	$877. 7
Capital equipment	63. 4
Construction	[1] 93. 2
	1, 034. 3

[1] Funding of $102.2 million is requested.

Note. Adapted from "Hearings and Reports on Atomic Energy, Volume 159" (p.2472), Joint Committee on Atomic Energy, 1972, Washington: U.S. Government Printing Office.

In the early 1980s interest in the cost of nuclear weapons arose anew, following the announcement of the Reagan administration's ambitious strategic modernization program. But it was not until October 1994 that the nongovernmental Defense Budget Project (now the Center for Strategic and Budgetary Assessments) produced the first estimate of the historical costs incurred by the U.S. nuclear weapons program. According to the assessment, the total costs incurred were $4.1 trillion, while actual expenditures through 1994 were $3.7 trillion (in constant 1995 dollars). Needless to say, the United States did not develop its nuclear arsenal in a vacuum. A variety of international and domestic factors profoundly influenced the scale and

[13] Joint Committee on Atomic Energy, *Hearings and Reports on Atomic Energy, Volume 159*, Washington, U.S. Government Printing Office, 1972, p.2473.

pace of the nuclear buildup.[14] We note that 'strategic' nuclear forces are referred to in tables 4 and 6 only, where the meaning of 'strategic', in the slightest non-sensical way of official parlance, has come to denote long-range nuclear forces. Not included are sub-strategic (i.e., tactical, theatre, battlefield, short-and-medium range) nuclear forces, for which comparable figures are not available. The sub-strategic component is quite sizable in the US and Soviet forces but rather marginal in the forces of the lesser nuclear powers.[15]

Table 6: Military Personnel in Strategic Nuclear Forces, 1989

	Number[a]	Share of total armed forces (%)
USA	..	..
USSR	410 500	*9.6*
Britain	2 100	*0.6*
France	18 700	*4.0*
China	90 000	*3.0*

[a] Practices of manpower utilization differ widely in national armed forces. The Soviet Union is well known for inefficient manpower management ('over-staffing'). In Britain, major functions in the nuclear strategic force are carried out by civilian personnel. No equivalent figures are available for the USA. However, the US Department of Defense had certified 76 588 persons 'with access to nuclear weapons' in 1989. This figure, which obviously includes personnel in sub-strategic nuclear missions, would amount to 3.6% of US armed forces.

Note. Adapted from "Security without Nuclear Weapons?: Different Perspectives on Non-nuclear Security" (p.63), R.C. Karp, 1992, Oxford: Oxford University Press.

Besides strategic nuclear weapons, the costs of U.S. tactical nuclear weapons are hard to identify. The Military Services usually inform that the costs are small because the costs of the manpower and the weapon system, in the case of dual-capable systems, are attributable to the conventional capability. But the costs are not small. The nuclear weapon storage sites have to be guarded and the weapons maintained. Some of the systems are not dual capable in any meaningful sense, and dual capability is considered an illusion. Furthermore, the question of

[14] Schwartz, Stephen I., *Atomic Audit: The Costs and Consequences of U.S. Nuclear Weapons since 1940*, Washington, Brookings Institution Press, 2011, p.12.

[15] Karp, Regina C., *Security without Nuclear Weapons?: Different Perspectives on Non-nuclear Security*, Oxford University Press, 1992, p.62.

the costs of nuclear weapons related to the decision of its reductions. A good reason to reduce the number of nuclear weapons is that as long as they are there, there will be pressures to replace them with newer weapons. The cost of a nuclear weapon is a complex matter. What is considered cost depends in large part on how the fissionable material is valued.[16] What emerges from Table 3 and 5 is the fact that with all nuclear powers the nuclear component consumes only a minor fraction of total financial and manpower resources devoted to national defense. This is not a new insight but still a surprising one in view of the overpowering stature which the nuclear powers derive from their nuclear status. Seen in this way, nuclear weapons reflect a uniquely cost-effective allocation of military resources.[17] Besides estimations of the costs of nuclear weapons, an additional cost is rarely considered – the costs of keeping nuclear weapons information secret and secure. The costs of nuclear secrecy are so difficult to measure that only a minimum estimate can be made, in the neighborhood of $3.4 billion. This is the total measurable cost of Department of Defense for information security from 1990 through 1995, and two relatively small charges relating to AEC clearances in 1948 and 1953.[18] Be that as it may, the high costs of secrecy deserve to be questioned, as can the absolute value of nuclear secrecy itself. It might be argued that nuclear secrecy as practiced in the United States has limited value because of its failure to meet a major stated goal: to prevent nuclear proliferation.[19] Total expenditure worldwide on programs for the production, maintenance, and modernization of nuclear weapons is not known. In 2011, it was claimed that the United States was planning to spend an estimated USD 700 billion on nuclear weapons and related programs over the coming ten years. In 2015, the US Department of Defense informed the US Congress that it needed about USD 270 billion in additional funding for the modernization of the US

[16] United States Congress, *Nuclear Weapons and Foreign Policy: Hearings Before the Subcommittee on U.S. Security Agreements and Commitments Abroad and the Subcommittee on Arms Control, International Law and Organization of the Committee on Foreign Relations, United States Senate, Ninety-third Congress, Second Session, on U.S. Nuclear Weapons in Europe and U.S.-U.S.S.R. Strategic Doctrines and Policies, March 7, 14, and April 4, 1974*, Washington, U.S. Government Printing Office, 1974, p.76.

[17] Karp, Regina C., *Security without Nuclear Weapons?: Different Perspectives on Non-nuclear Security*, Oxford University Press, 1992, p.62.

[18] Schwartz, Stephen I., *Atomic Audit: The Costs and Consequences of U.S. Nuclear Weapons since 1940*, Washington, Brookings Institution Press, 2011, p.433.

[19] Schwartz, Stephen I., *Atomic Audit: The Costs and Consequences of U.S. Nuclear Weapons since 1940*, Washington, Brookings Institution Press, 2011, p.481.

nuclear triad (land-, air-, and sea-based nuclear weapons capabilities): USD 18 billion per year for fifteen years starting in 2021. At the high-level meeting of the UN General Assembly on nuclear disarmament in September 2013, many states expressed concern that, 'in spite of global financial constraints', substantial sums continued to be invested in modernizing and developing new types of nuclear weapons, 'which undermines efforts for their elimination and is inconsistent with disarmament obligations.'[20] American nuclear weapons introduced into Europe in the mid-1950s were generally old-timers, "dirty" in their nuclear fallout, often too big in nuclear blast for their targets, and so devastating in their wide-swinging reach that they were not considered precise and discriminate enough for modern war planners. With a total nuclear bang of several hundred megatons, this arsenal worried Moscow, as well as NATO, and some Pentagon officials, too. Besides the U.S. weapons, France and Britain could have thrown several hundred weapons into the battlefield exchange.[21] On the other hand, in 1995 the non-nuclear weapon states came under intense pressure, mainly from the United States, to agree to an indefinite extension of the NPT. They yielded – and got very little in exchange: a more thorough review process and a test ban that leaves the nuclear weapon states free to "modernize" their weapons. In context, the United States, France, Britain and Russia have very little interest in the views of the non-nuclear weapon states.[22] In area of arms control, the Bush administration announced that as part of its new relationship with Russia it would enact unilateral cuts in the U.S. nuclear arsenal to 1,700-2,200 deployed strategic warheads (not counting those in reserve or on launchers undergoing repair). It also gave notice of its intended withdrawal from the ABM Treaty, effectively in June 2002, to begin fulfilling its plan to build nationwide missile defenses. Furthermore, the Bush administration announced in late 2001 in its Nuclear Posture Review that it would keep many of the nuclear weapons removed from its arsenal in a strategic reserve, rather than destroying them. The administration also included in its 2003 budget

[20] Maslen, Stuart C., *The Treaty on the Prohibition of Nuclear Weapons: A Commentary*, Oxford University Press, 2013, p.112.

[21] United States Congress, *Nuclear Weapons and Foreign Policy: Hearings Before the Subcommittee on U.S. Security Agreements and Commitments Abroad and the Subcommittee on Arms Control, International Law and Organization of the Committee on Foreign Relations, United States Senate, Ninety-third Congress, Second Session, on U.S. Nuclear Weapons in Europe and U.S.-U.S.S.R. Strategic Doctrines and Policies, March 7, 14, and April 4, 1974*, Washington, U.S. Government Printing Office, 1974, p.300

[22] Blackaby, Frank, "Time for a peasants' revolt". *The Bulletin of the Atomic Scientists.* Vol.53, no.6, 1997:4.

request funds to make it easier for the United States to resume nuclear testing if such a decision were to be made in the future. But the moves brought considerably negative reactions from foreign governments that questioned U.S. commitments to disarmament and the test ban. China, in particular, indicated its frustration with new U.S. policies on reversible arms control and on missile defenses, which it considered threatening to its small nuclear arsenal.[23] Regarding non-nuclear-weapon states (NNWS), determining the legal regulation of use of force in relation to the use of nuclear weapons, the United States, being one of the NWS, stipulated "*U.S. Assurance to Non-Nuclear-Weapons States*" – On November 17, 1978, Ambassador Adrian S. Fisher, a former Director of the United States Arms Control and Disarmament Agency and the United States Representative to the Committee on Disarmament, submitted the following ***"Proposal of the United States of America for Strengthening the Confidence of Non-Nuclear-Weapon State in their Security against the Use of Nuclear Weapons"***:

> The approach of the United States to strengthening the confidence of non-nuclear-weapons states in their security against the threat or use of nuclear weapons takes into account paragraph 59 of the Final Document of the Special Session on Disarmament (SSOD) which provides:
>
> > *"In the same context, the nuclear-weapon states are called upon to take steps to assure the non-nuclear-weapon states against the use or threat of use of nuclear weapons. The General Assembly notes the declarations made by the nuclear-weapons states and urges them to pursue efforts to conclude, as appropriate, effective arrangements to assure non-nuclear-weapon states against the use or threat of use of nuclear weapons."*[24]

Such efforts toward non-nuclear-weapon states were manifested by creating so-called "nuclear-weapon free zones." The concept of Nuclear-Weapon-Free Zone (NWFZ) is a distinct one, which means denuclearization, non-nuclearization and nuclear free. Thus, the concept of

[23] Diehl, Sarah J., and Moltz, James C., *Nuclear Weapons and Nonproliferation: A Reference Handbook*, California, ABC-CLIO, 2008, p.25.

[24] Nash, M.L., *Digest of United States Practice in International Law*, Washington, Office of the Legal Adviser, Department of State, 1978, p.1610.

the NWFZ is a flexible one. Therefore, the criterion to establish NWFZ depends on the group of countries interested for establishing such a zone in their respective regions. Accordingly, the objectives of the zone can also be different from that of any one established already. However, a general objective for establishing a zone in any part of the world should consider the following criterion:

- The security of states included in the zone;
- World security;
- Non-proliferation of nuclear weapons;
- Regional arms control consideration; and
- Security treaties;

The interested group of countries can select any one of the above objectives and formulate treaty for establishing NWFZ in their respective zone or region. In addition to the UN principles, the countries in the respective zone can also develop new criteria for the purpose.[25] Such consideration originates from Warsaw Treaty member states being convinced that the establishment and effectiveness of nuclear-weapon-free zones depended largely on the attitude of the other States, especially of the nuclear States, towards them.[26]

I.III. The Global Status of Nuclear Weapons: 2010-2021

Ever since the occurrence of the Cold War, the U.S. and USSR/Russia were considered as the main superpowers to contain great possessions of nuclear weapons, while China, Great Britain and France, later emerging as the additional three NWS, manifested significantly weaker nuclear weapon capacities in comparison. The further appearance of small, but new nuclear weapons states seemingly increases their chances of manifesting nuclear security. On the other hand, Nicholas Wheeler, professor of international politics at the University of Birmingham, stated that nuclear weapons cannot be accepted as a remedy for security problems in the developing world and suggests the development of regional security policies as the only

[25] Moorthy, P., *Nuclear-Weapon-Free-Zone*, New Delhi, Concept Publishing Company, 2006, p.2.
[26] United States Arms Control and Disarmament Agency, *Documents on Disarmament*, Washington, United States Arms Control and Disarmament Agency, 1986, p.175.

alternative to proliferation. Such policies should aim to foster security co-operation between states and encourage democratic processes within.[27]

Table 7: The World's Nuclear Forces, 2010-2014

	First test	*2010*	*2011*	*2012*	*2013*	*2014*		
						*Deployed**	*Other*	*Total*
US	1945	9600	8500	8000	7700	1920	5380	7300
Russia	1949	12000	11000	10000	8500	1600	6400	8000
UK	1952	225	225	225	225	160	65	225
France	1960	300	300	300	300	290	10	300
China	1964	240	240	240	250		250	250
Israel	. . .	80	80	80	80		80	80
India	1974	60–80	80–100	80–100	90–110		90–110	90–110
Pakistan	1998	70–90	90–110	90–110	100–120		100–120	100–120
North Korea	2006						6–8	6–8
Totals		**22,595**	**20,535**	**19,035**	**17,245**	**3,970**	**12,402**	**16,372**

Note. Adapted from "Nuclear Weapons and International Security: Collected Essays" (p.3), by R. Takhur, 2015, New York, NY: Routledge.

While in Table 3 we had five nuclear possessor states in total (U.S., USSR/Russia, Britain, France and China), as displayed in Table 7, we notice the addition of four new nuclear possessor states (Israel, India, Pakistan and North Korea). Within this context, the so-called "second world" is perceived as a pessimist predicament: nuclear weapons spread in Asia and in the Middle East with strategic reach into Asia, but not in order to assume that nuclear war or nuclear terrorism is more likely to occur. Also, the Asian nuclear balance of power has established no consensual ladder of capability. Notional nuclear forces are assigned based on possible future capabilities, perceived threats, and decision-making proclivities.[28] Similarly enough, we notice the objectives in relation to nuclear weapons and the new nuclear possessor states, where Israel, India, Pakistan, and North Korea (whose capacity at present is probably limited) are considered the four nuclear nations who are not signatories to the Nuclear Non-Proliferation Treaty. Although these four are not liable to the treaty provisions, there is an expectation that they will behave

[27] Karp, Regina C., *Security without Nuclear Weapons?: Different Perspectives on Non-nuclear Security*, Oxford University Press, 1992, p.18.

[28] Cimbala, Stephen J., "Nuclear First Use: Prudence or Peril?" *Joint Force Quarterly*. Vol.51, no.4, 2008:32.

as if they were, for example, that they will give nuclear technology to non-nuclear states only for peaceful purposes (and subject to safeguard such as inspection). There is also an expectation that the non-signatory nuclear powers will not behave like "rogue states", that is, that they can be trusted not to use nuclear weapons to threaten their neighbors or aggrandize themselves at their neighbor's expense.[29] Their goals and interests lie in keeping and developing their nuclear weapons. On the other hand, they are not willing to give up their nuclear arsenals to be parties to the treaty as NNWS, even though the international community will maintain its position in considering them undeclared NWS from the legal perspective.[30] However, providing universality to the NPT does not seem feasible as long as some states are not under its umbrella. It is hard to imagine that countries such as Israel, India or Pakistan would agree to join the Treaty as NNWS. Two countries that are parties – Iraq and North Korea – decided, at different times, to violate the treaty and make their own nuclear weapons. The Iraqi case seems to have been solved as its nuclear program has been destroyed. The North Korean case has not yet been solved. The complexity of the matter is if NWS require nuclear weapons for their security, it is impossible for them to prevent others from needing similar weapons for theirs.[31] In spite of that, Dr. Jeffrey Lewis, Director of the East Asia Nonproliferation Program (EANP) at the James Martin Center for Nonproliferation Studies, had stated the following:

> *"There are no countries producing "new" nuclear warheads today, although the United States, Russia and China continue to manufacture nuclear warheads that were designed and tested before each signed the Comprehensive Nuclear Test Ban Treaty in 1996. Like the United States, both Russia and China are conducting subcritical experiments at their former nuclear test sites to support ongoing stockpile stewardship… Russia and China could not, however, develop new nuclear weapons with yields that I would consider militarily significant without conducting tests large enough to be readily detected.*

[29] Flynn, James R., *Beyond Patriotism: From Truman to Obama*, Luton, Andrews UK Limited, 2011, Objectives: Nuclear weapons and Israel, para.1)

[30] Negm, Namira, *Transfer of Nuclear Technology Under International Law: Case Study of Iraq, Iran and Israel*, Leiden, Martinus Nijhoff Publishers, 2009, p.56.

[31] Negm, Namira, *Transfer of Nuclear Technology Under International Law: Case Study of Iraq, Iran and Israel*, Leiden, Martinus Nijhoff Publishers, 2009, p.57.

Overall, I believe the United States is the best equipped of the three states to maintain its stockpile of nuclear weapons under the current moratorium on explosive nuclear testing."[32]

France maintained a flat trajectory in its nuclear arsenal, but had already begun plans for next-generation systems and showed few signs of further reductions. China's policy remained opaque, although experts noted no significant effort to engage in nuclear arms race with other powers. One of the biggest question marks surrounded the intentions of smaller nuclear powers: Israel, India, Pakistan and North Korea. These states remained outside NPT controls. Another growing concern was whether the emergence of new nuclear weapons states in particular regions might encourage long-standing NPT members to rethink their non-nuclear policies.[33]

Table 8: World Nuclear Forces, January 2020

All figures are approximate. The estimates presented here are based on public information and contain some uncertainties, as reflected in the notes to tables 10.1–10.10.

Country	Year of first nuclear test	Deployed warheads[a]	Stored warheads[b]	Other warheads	Total inventory
United States	1945	1 750[c]	2 050[d]	2 000[e]	5 800
Russia	1949	1 570[f]	2 745[g]	2 060[e]	6 375
United Kingdom	1952	120	95	–	215[h]
France	1960	280	10	..	290
China	1964	–	320	–	320
India	1974	–	150	..	150
Pakistan	1998	–	160	..	160
Israel	..	–	90	..	90
North Korea	2006	–	..	[30–40]	[30–40][i]
Total[j]		**3 720**	**5 620**	**4 060**	**13 400**

.. = not applicable or not available; – = zero; [ ] = uncertain figure.

[32] United States Congress, *Nuclear Weapons Modernization in Russia and China: Understanding Impacts to the United States: Hearing Before the Subcommittee on Strategic Forces of the Committee on Armed Services, House of Representatives, One Hundred Twelfth Congress, First Session, Hearing Held October 14, 2011*, Washington, U.S. Government Printing Office, 2012, p.10.

[33] Diehl, Sarah J., and Moltz, James C., *Nuclear Weapons and Nonproliferation: A Reference Handbook*, California, ABC-CLIO, 2008, p.32.

Note. Adapted from "Nuclear modernization speeding up as arms control on the brink: report," by A. Mehta, 2020 (https://www.defensenews.com/smr/nuclear-arsenal/2020/06/14/nuclear-modernization-speeding-up-as-arms-control-on-the-brink-report/).In the public domain.

The Stockholm International Peace Research Institute (SIPRI) estimated that at the end of 2019, nine countries possessed a total of 13,400 nuclear warheads, down with 13,865 estimated in previous reports, which in turn was a drop from the 14,465 the year before. The reductions were primarily due to numbers dropping under the new START nuclear agreement between Russia and the U.S., which experts largely expect not to be renewed at the start of the new year. Russia is the largest holder of nuclear warheads, according to SIPRI's numbers, with 6,735 total, of which 1,570 are deployed. The U.S. follows at 5,800, with 1,750 deployed. The two countries account for over 90 percent of the world's nuclear arsenal.[34]

Table 9: Status of World Nuclear Forces 2021

Status of World Nuclear Forces 2021					
Country	**Deployed Strategic**	**Deployed Nonstrategic**	**Reserve/ Nondeployed**	**Military Stockpile[a]**	**Total Inventory[b]**
Russia	1,600[c]	0[d]	2,897[e]	4,497	6,257[f]
United States	1,700[g]	100[h]	2,000[i]	3,800[j]	5,550[k]
France	280[l]	n.a.	10[l]	290	290
China	0[m]	?	350	350	350[m]
United Kingdom	120[n]	n.a.	105	225	225[n]
Israel	0	n.a.	90	90	90[o]
Pakistan	0	n.a.	165	165	165[p]
India	0	n.a.	160	160	160[q]
North Korea	0	n.a.	(45)	(45)	(45)[r]
Total:[s]	**~3,700**	**~100**	**~5,820**	**~9,600**	**~13,100**

Note. Adapted from "Status of World Nuclear Forces" by the Federation of American Scientists, 2021 (https://fas.org/issues/nuclear-weapons/status-world-nuclear-forces/) In the public domain.

[34] Mehta, Aaron. Nuclear modernization speeding up as arms control on the brink: report. *Defense News*. 2020.

At the beginning of 2021, the US Defense Department maintained an estimated stockpile of 3,800 nuclear warheads for delivery by 800 ballistic missiles and aircraft. Most of the warheads in the stockpile are not deployed, but rather stored for potential upload onto missiles and aircraft as necessary. It is estimated that approximately 1,800 warheads are currently deployed, of which roughly 1,400 strategic warheads are deployed on ballistic missiles and another 300 at strategic bomber bases in the United States. An additional 100 tactical bombs are deployed at air bases in Europe. The remaining warheads—approximately 2,000—are in storage as a so-called hedge against technical or geopolitical surprises. Several hundred of those warheads are scheduled to be retired before 2030.[35] Having these statistics in mind, it is widely assumed that, for better or worse, the existence of nuclear weapons has profoundly shaped our lives and destinies. Some find the weapons supremely beneficial. Defense analyst Edward Luttwak says, *"We have lived since 1945 without another world war precisely because rational minds… extracted a durable peace from the very terror of nuclear weapons."* Others argue that, while we may have been lucky so far, the continued existence of the weapons promises eventual calamity, as Jonathan Schell dramatically concludes that if we do not *"rise up and cleanse the earth of nuclear weapons,"* we will *"sink into the final coma and end it all."*[36] The dichotomy of the existence of nuclear weapons with the purpose of manifesting both national and international security will likely continue to be contrastingly scrutinized by various scholars. And although this may be true, the objective reality must be reflected upon the existence and utilization of nuclear weapons, rather than subjective opinions which primarily tend to indirectly refer to limiting national interests.

I.IV. The Legislative Future of Nuclear Weapons Proliferation

According to the statistical data analysis, we conclude the fairly dynamic evolution of nuclear weapons and how certain nations have transferred from NNWS to NWS before the eyes of the international community. Circumstances of stockpiling, utilization, proliferation, banning and

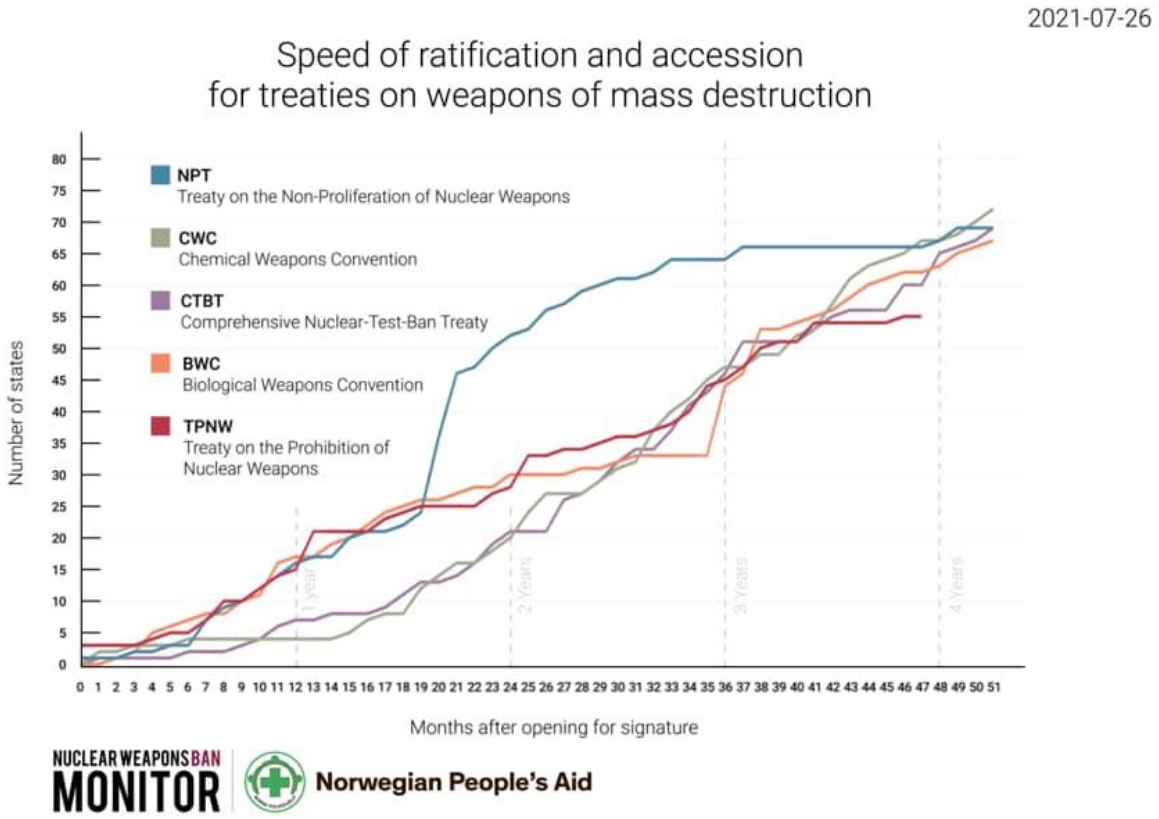
[35] Kristensen, Hans M., and Korda, Matt. Nuclear Notebook: United States nuclear weapons, 2021. *Bulletin of the Atomic Scientists*. 2021.

[36] Lynn-Jones, Sean M., Miller, Steven E., and Van Evera, Stephen, *Nuclear Diplomacy and Crisis Management: An International Security Reader*, Cambridge, The MIT Press, 1990, p.3.

deployment nuclear weapons have been mostly dependent on NWS nuclear stockpile amounts, as well as various international treaties between both NWS and NNWS. It is currently speculated that the fate of nuclear weapons may depend on the Treaty on the Prohibition of Nuclear Weapons (TPNW). It prohibits their use, threat of use, development, production, testing and stockpiling.[37] It had official become a part of international law. On 7 July 2017, an overwhelming majority of States (122) adopted the TPNW. By 24 October 2020, 50 countries signed and ratified it which ensured the Treaty enters into force 90 days later. So on 22 January 2021, nuclear weapons became illegal.[38] Thus far in 2021, four states have ratified the TPNW. In the course of 2020, 17 states ratified or acceded. Although slower than the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), the TPNW's speed of ratification and accession for a long time was on average the same as for the other treaties on weapons of mass destruction (WMD): the Comprehensive Nuclear-Test Ban Treaty (CTBT), the Biological Weapons Convention (BWC), and the Chemical Weapons Convention (CWC). At almost four years after the TPNW opened for signature, however, its rate has fallen behind all of the other treaties.[39]

[37] Mabeza, Sarah. A date to remember: the banning of Nuclear Weapons in 2021. *International Committee of the Red Cross*. 2021.
[38] Collin, Jean-Marie. Nuclear weapons are illegal at last. *Greenpeace*. 2021.
[39] Nuclear Weapons Ban Monitor. The Status of the TPNW. *Nuclear Weapons Ban Monitor*. 2021.

Figure 1: Speed of ratification and accession for treaties on weapons of mass destruction



Note. Adapted from "The Status of the TPNW" by Nuclear Weapons Ban Monitor, 2021 (https://banmonitor.org/tpnw-status) In the public domain.

Yet the majority of world nations expect its significant contribution toward global security, as many NNWS have exclaimed their ultimate support against nuclear weapons proliferation and utilization. Regarding NWS on the other hand, none of them have signed the Treaty. As long as they refuse to sign, the Treaty does not apply to them directly – but it does make it much harder for them to justify their opposition. They can expect to face increasing international criticism, as well as internal political pressure.[40] In addition to the nine nuclear-armed states, there are also 31 nuclear-weapon-complicit states that endorse or acquire to the use of nuclear

[40] Collin, Jean-Marie. Nuclear weapons are illegal at last. *Greenpeace*. 2021.

weapons on their behalf[41], meaning that world nations currently manifest a divided relationship with nuclear weapons in relation to the TPNW.

Table 10: Criteria for TPNW Support

Number	Category	Criterion
1	States parties	States that have either signed and ratified or have acceded to the TPNW.
2	Signatories	States that have signed the TPNW but not yet ratified it.
3	Other supporters	States that are not in category 1 or 2 but whose most recent vote in the UN on the TPNW (on the adoption of the Treaty on 7 July 2017 or on the subsequent annual UN General Assembly resolutions on the TPNW) was 'yes'.
4	Undecided	All states that are not in category 1 or 2 and whose most recent vote in the UN on the TPNW (on the adoption of the Treaty on 7 July 2017 or on the subsequent annual UN General Assembly resolutions on the TPNW) was an abstention, or that never participated in such a vote.
5	Opposed	All states that are not in category 1 or 2 and whose most recent vote in the UN on the TPNW (on the adoption of the Treaty on 7 July 2017 or on the subsequent annual UN General Assembly resolutions on the TPNW) was 'no'

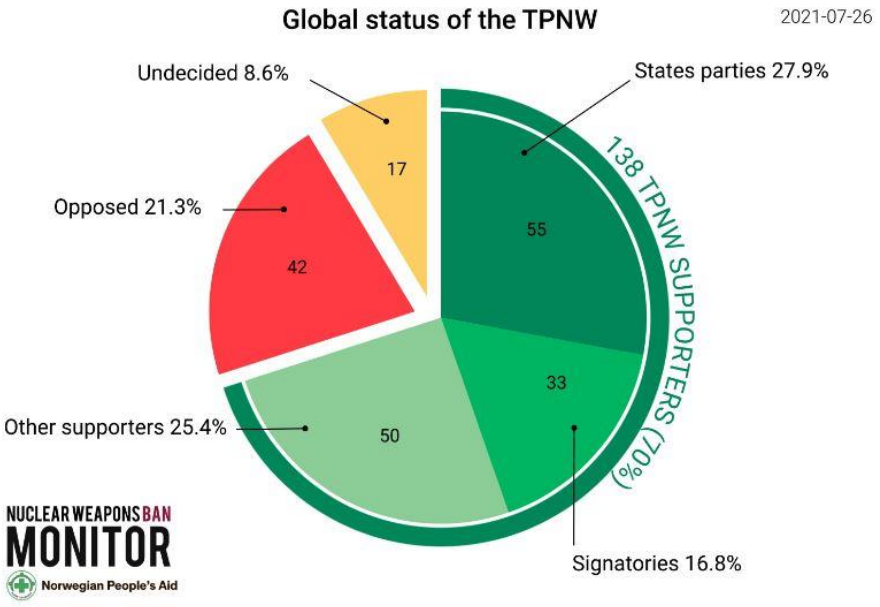
Note. Adapted from "The Status of the TPNW" by Nuclear Weapons Ban Monitor, 2021 (https://banmonitor.org/tpnw-status) In the public domain.

NWS' passive behavior indicates that the possession of nuclear weapons is still perceived as a major advantage from which no state would even want to consider giving up, which is understandable. The possession of nuclear weapons allows states to act more independently of allies, engage in aggression, expand their position and influence, reinforce and strengthen alliances, or stand more firmly in defense of the status quo. Claims by NNWS which pursue the "prohibition of nuclear weapons", on the other hand, are perceived as fairly naïve. The moment of nuclear weapons' discovery could be described as "the point of no return". Nuclear weapons cannot be simply "un-discovered", especially when NWS have already had a taste of the eminent ascendancies that come along with their possession. Just as the modern world cannot imagine life without electricity or internet access, NWS in an identical manner cannot imagine maintaining their national superiority without the possession of nuclear weapons. It cannot be discussed whether or how it would be achievable to live in a world without nuclear weapons, but rather how to safely adapt living in a world where nuclear weapons exist. Moreover, it is

[41] Pressenza. Over two-thirds of the world's countries support the TPNW. *Pressenza.* 2019.

possible for the refusal of NWS to sign the TRNW to cause a completely reverse effect from the TPNW objectives – the emergence of new NWS and, consequently, a new nuclear arms race.

Figure 2: Global Status of the TPNW



Note. Adapted from "The Status of the TPNW" by Nuclear Weapons Ban Monitor, 2021 (https://banmonitor.org/tpnw-status) In the public domain.

Triggered by opposing NWS, both signatories and non-signatories of the TPNW might feel just as vulnerable as before the TPNW. The only difference is that while signatories have legal obligations toward the TPNW, the treaty cannot establish legal obligations for non-signatories. Hence, it is fairly possible for remaining non-signatory NNWS to consider obtaining nuclear weapons in the future, which would not be in favor of both NWS and NNWS. Considering the divided relationship with the TPNW, multiple reasons seem appropriate enough in explaining possible motivations of non-signatory NNWS obtaining nuclear weapons as means for defensive purposes, rather than means for offensive purposes. Principles of military psychology would recognize nuclear aspirations as a form of counterterrorism under the assumption of a significantly smaller chance for NWS threatening or even conducting a nuclear attack, in cause of certain political contradictions and conflicts between the two states. On the other hand,

current NWS may consequently achieve political objectives by resorting to nuclear weapons, as well as non-signatory NNWS who do not support the prohibition of nuclear weapons, possible due to strong nuclear aspirations. Just a few years back, it was deemed highly improbable that any use of a nuclear weapon by a state would occur outside an armed conflict, but it is not inconceivable. Potentially, such an act would amount to genocide when 'committed with intent to destroy, in whole or in part, a national, ethnical, racial, or religious group as such. If it were undertaken as part of a widespread or systematic attack against a civilian population where the perpetrator has knowledge of the attack, it could amount to a crime against humanity.[42] As of 2021, the possibility of nuclear weapons being used in regional or global conflicts is growing, according to a newly disclosed Pentagon doctrinal publication:

> *"Despite concerted US efforts to reduce the role of nuclear weapons in international affairs and to negotiate reductions in the number of nuclear weapons, since 2010 no potential adversary has reduced either the role of nuclear weapons in its national security strategy or the number of nuclear weapons it fields. Rather, they have moved decidedly in the opposite direction… As a result, there is an* ***increased potential for regional conflicts involving nuclear-armed adversaries*** *in several parts of the world and the* ***potential for adversary nuclear escalation in crisis or conflict****."*[43]

Society's ultimate necessity of continuously identifying unconventional manifestations of violence conducted by state-actors through the utilization of nuclear weapons must be considered. An attempt to formulate a better understanding of such underlying risk, as well as to estimate its probability, leads us to the conceptualization of "Nuclear-Based State Terrorism" (hereinafter NBST) – a *sui generis* subfield of state terrorism analyzed through the prism of multidisciplinary approaches, all in order to undertake the complexity of enabling national and global security on to significantly higher levels.

---

[42] International Law and Policy Institute, *Nuclear Weapons under International Law: An Overview*, Geneva Academy of International Humanitarian Law and Human Rights, 2014, p.7.

[43] Aftergood, Steven. Pentagon Sees 'Increased Potential' for Nuclear Conflict. *Federation of American Scientists.* 2021.

Chapter II: The Concept of Nuclear-Based State Terrorism

II.I. The Geopolitical Phenomenology of Nuclear-Based State Terrorism

Given that the very nature of nuclear weapons discourse by nuclear weapon states (NWS) is unavoidably hypocritical and dishonest, it is time for a closer look at the apparently self-evident, and certainly self-serving (to NWS) claim that one of the great dangers today and tomorrow, if not *the* great danger, is that of nuclear weapons being built or falling into the hands of "terrorist groups".[44] This viewpoint only manages to support ramifications of justifying and decriminalizing NWS.

Introducing the concept of NBST may be confronted with limited and misguided perceptions by the majority of people who would likely associate the gravity of such concept with the 1945 Hiroshima and Nagasaki bombings. In reality, NBST demonstrations are much more sophisticated, complex and diverse by nature. On behalf of NWS, the behavior of certain individuals (e.g., president, prime minister) or a small group of people (e.g., nuclear command authority, national command authority, central military commission) lies within a subjective state which is reflected toward the objective state of selected targets and audience in a destructive manner. We portray NBST as a particular social phenomenon – the subjective manifestation of a nuclear threat or attack within the society of a certain nation, capable of influencing political opinions and behaviors of individuals or groups of people that are favorable to state actors. Yet the mere portrayal of NBST as a social phenomenon is not enough. Establishing the concept of NBST requires an appropriate phenomenological model. By manifesting supplemental constituents, it is not to say that NBST would directly originate from the notion of state terrorism, but rather that it would attempt to explain their interrelation under the presumption of NBST demonstrations representing specific rules of conduct which extend beyond legal regulations. Such interpretation drives the necessity of developing a better theoretical understanding of NBST as an underlying risk. Illustrating the phenomenology of NBST, however, represents a rather challenging task due to the existence of an ancillary

[44] Vanaik, Achin. "The Issue of Nuclear Terrorism". *Economic and Political Weekly.* Vol.45, no.17, 2010: 10.

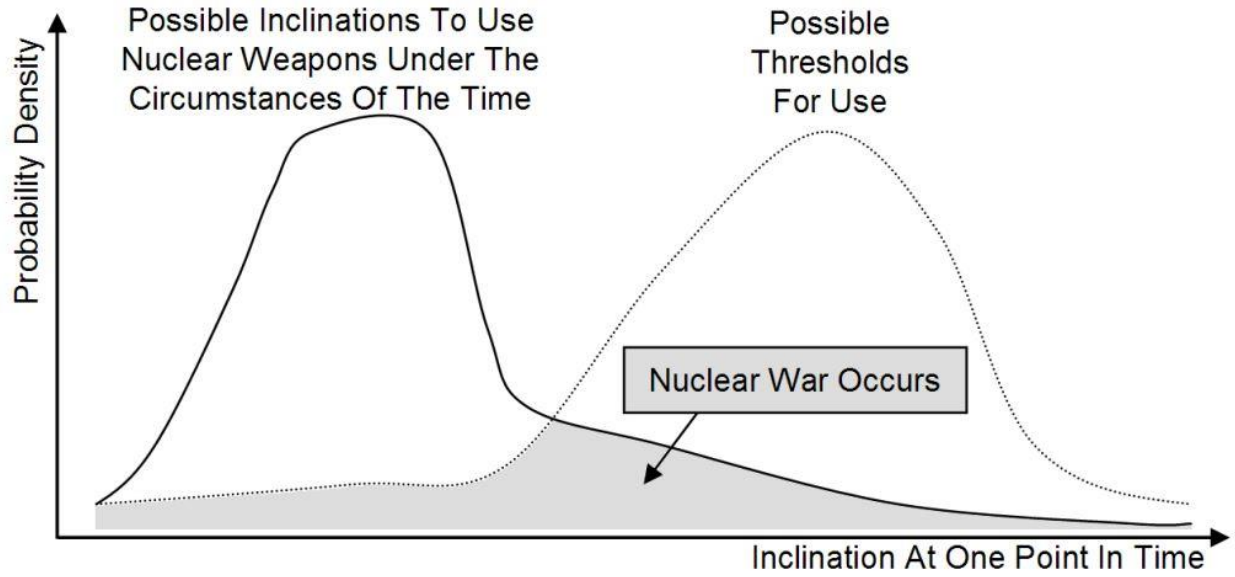
element – the conductible diversification in terms of territorial boundaries, thus giving such phenomenological model a broad geopolitical exposure. Moreover, it provides two separate NBST outlooks which differ significantly. For that matter, inaugurating the phenomenological model of NBST is contingently achieved by the mathematical-statistical methodology of implementing two individual simple linear regression analyses, based on acknowledged data. By stating that NBST demonstrations cannot occur for any particular reason, it is evident that the existence of peculiar circumstances, whether being domestic or transnational, significantly contributes toward their practical realization. Consequently, the aim of both regression analyses is to examine the relationship between the dependent variable *Y* and the independent variable *X* that trigger state actors to conduct NBST. While *X* represents circumstances that occur autonomously, *Y* represents circumstances that are contingent on *X*, hence their relationship is labeled as a "trigger" from which NBST demonstrations represent their outcome. In other words, we must understand what "triggers" would cause state actors to resort to nuclear weapons in order to obtain the expected reaction from selected targets.

To begin with, *transnational NBST demonstrations* are speculated to include nuclear threats and attacks toward rival NWS or NNWS during peacetime. For NWS to specifically launch a nuclear attack, its inclination to do so must cross its threshold for nuclear weapons use. By "inclination", we mean the degree to which a state (or specific individual(s) within the state) desires or prefers to launch a nuclear attack. In general, states are not inclined to use nuclear weapons—they only consider using them under certain circumstances, such as when they face (or perceive themselves to face) major threats. A state's inclination to launch a nuclear attack and its threshold for carrying out an attack will in general change over time, due to changes in geopolitical circumstances, national policies, and the personnel involved in nuclear weapons attack decisions.[45] Current reports of NWS increasing their nuclear arsenal or their role in national security strategies might be reciprocally perceived as a major threat. Manifestations of nuclear aspirations by current NNWS are also included. For example, Iran's development of increasingly long-range ballistic missile capabilities, and its aggressive strategy and activities to

[45] Baum, Seth D., De Neufville, Robert, and Barrett, Anthony M., *A Model For The Probability Of Nuclear War*, Global Catastrophic Risk Institution Working Paper 18-1, 2018, p.5.

destabilize neighboring governments, raises questions about its long-term commitment to forgoing nuclear weapons capability.[46] Generally speaking, one does not know a state's level of inclination or its threshold: both are uncertain. Absent this information, one must think in terms of probabilities. At any given point in time, a state's level of inclination could be within some range, as could its threshold.[47] Results obtained from both regression analyses, hence, simulate NWS' levels of inclination and threshold, under given variable points.

Figure 3: Illustrative sketch of probability distributions of possible levels of a nuclear-armed state's inclination and threshold at one point in time



Note. Adapted from "A Model for the Probability of Nuclear War" (p.7) by S.D. Baum, R. de Neufville, & A.M. Barrett, 2018, Global Catastrophic Risk Institution Working Paper 18-1.

In correspondence to admonitory events including the TPNW's status and the newly disclosed Pentagon doctrinal publication, the main objective of this simple linear regression analysis is to establish whether the relationship between the NWS' military strength rank (the dependent variable - *Y*) and the total nuclear weapons inventory per NWS (the independent variable – *X*) is

[46] Aftergood, Steven. Pentagon Sees 'Increased Potential' for Nuclear Conflict. *Federation of American Scientists.* 2021.

[47] Baum, Seth D., De Neufville, Robert, and Barrett, Anthony M., *A Model For The Probability Of Nuclear War*, Global Catastrophic Risk Institution Working Paper 18-1, 2018, p.7.

negative or positive, as well as to attempt to predict transnational NBST demonstrations as an outcome of that relationship. Observations derived from such relationship are perceived to affect NWS' political, strategic or military objectives concerning nuclear weapons. Synonymously, we set an alternative and null hypothesis addressing the variables' relationship:

- **Alternative Hypothesis ($P \leq 0.21$)** – *the total nuclear weapons inventory does influence NWS' military strength*;
- **Null Hypothesis ($P > 0.21$)** – *the total nuclear weapons inventory does not influence NWS' military strength*;

The values of both the independent variable *X* and the dependent variable *Y* are numerically displayed in table 11 below, respectively:

Table 11: Given Values for Variables *X* and *Y*

Subject: Nuclear Weapon States	Independent Variable (X): Total Inventory (2021)	Dependent Variable (Y): PowerIndex (2021)
United States	5550	0,0718
Russia	6257	0,0791
United Kingdom	225	0,1997
France	290	0,1681
China	350	0,0854
India	160	0,1207
Pakistan	165	0,2073
Israel	90	0,3464
North Korea	45	0,4673

***Note:** Regarding the dependent variable (Y) "Military Strength PowerIndex", nuclear capabilities are not taken into account;*

The *X* data are taken from the "Total Inventory" column in Table 9, while the *Y* data are taken from the Global Firepower (GFP) Annual Ranking for the year 2021, where the GFP notes that it utilizes **over 50 individual factors** to determine a given nation's **PowerIndex ('PwrIndx')** score with categories ranging from military might and financials to logistical capability and geography.[48] Nuclear capabilities not being taken into account within the GFP's PowerIndex is a very important detail that impacts the (*X,Y*) linear relationship by exposing the military-related

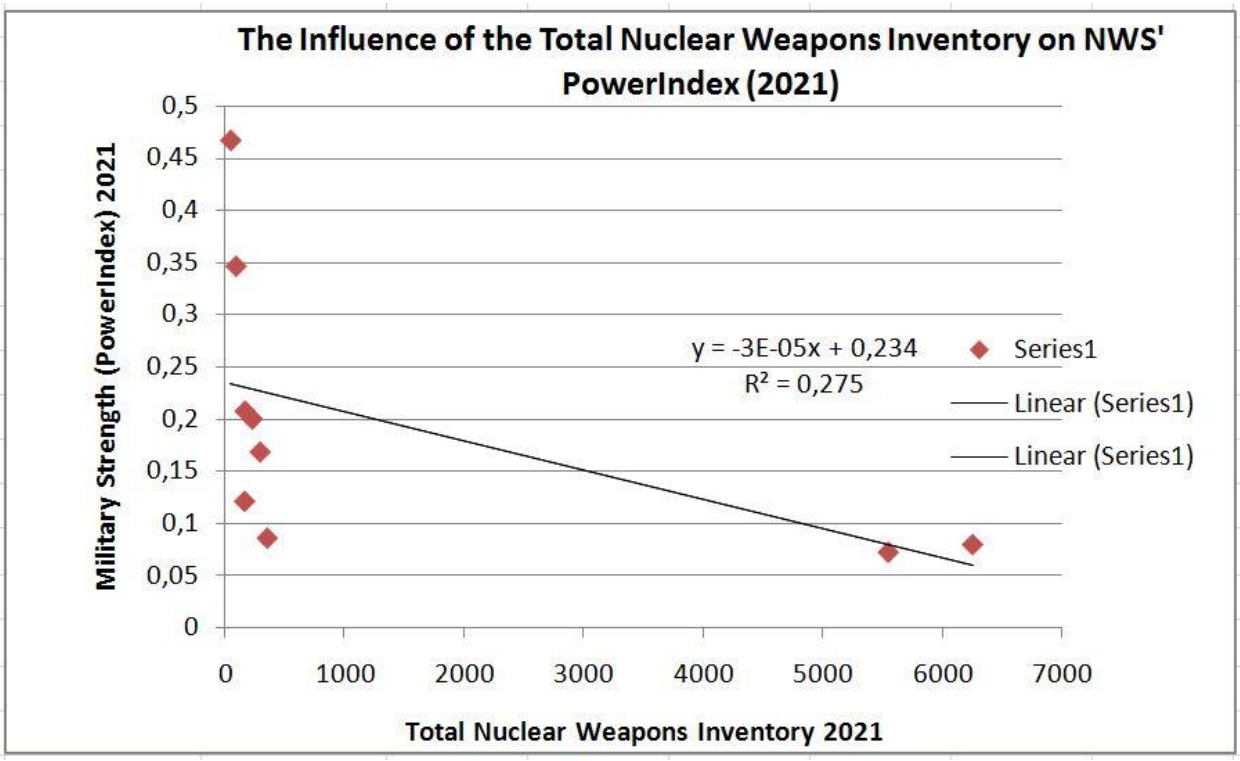
[48] Global Firepower. 2021 Military Strength Ranking. *Global Firepower*. 2021.

influence of nuclear weapons and reasons for their obtainment. The standard regression model[49] which establishes the linear relationship between *X* and *Y* is:

$$y_i = (\beta_0 + \beta_1 x_i) + \varepsilon_i \quad (1)$$

, where: ***Y*** = dependent variable; ***X*** = independent variable; β_0 = constant (intercept); β_1 = X's slope or coefficient; and ε = error term; Based on provided values for *X* and *Y* variables, standard regression model components are pragmatically displayed in the scatter plot below, describing their linear relationship.

Figure 4: Scatter Plot of the Influence of the Total Nuclear Weapons Inventory on NWS' Military Strength (PowerIndex) for 2021



The scatter plot displays the regression line sloping downwards, portraying the negative relationship between *X* and *Y*, where as *X* increases, *Y* tends to decrease by a constant amount

[49] Natural Resources Biometrics. Chapter 7: Correlation and Simple Linear Regression. *Natural Resources Biometrics*. n.d.

– the larger the total nuclear weapons inventory, the smaller the military strength rank (PowerIndex). The negative relationship amounts to significantly fewer NWS manifesting approximately powerful military strengths even with their hypothetical lack of nuclear weapons. The scatter plot describes an accurate political background concerning nuclear weapons obtainment, as well as the differences between weaker and stronger NWS, where the specific question for this analysis is for *which* States nuclear weapons contribute toward their military strength. We identify only four closest points to the regression line, those at the far left side being Pakistani values (165, 0. 2073) and British values (225, 0.1997), as well as those on the far right side being American values (5550, 0.0718) and Russian values (6257, 0.0791). This indicates that the majority of the data does not exactly fit through the regression line, where remaining points represent the values of weaker NWS in terms of military strength and, hence, draw further from the regression line. This analysis shows that newer NWS manage to increase their military strength more noticeably by obtaining nuclear weapons. Other advantages include abilities to issue nuclear threats for political, strategic or military objectives, increased chances of competing with stronger NWS, as well as deterring them from threatening or attacking. Although China, for instance, has never abandoned its minimum deterrence nuclear strategy, due to the comprehensive strategic threat that the US keeps posing to China, the nuclear capabilities Beijing needs to achieve "minimum deterrence" are now different from the past.[50] Furthermore, Israel views Iran as by far the most likely regional power to acquire nuclear weapons in the near term and has openly vowed to use military force to stop it. But a slew of other Mideast countries, some nominally Israel's allies or strategic partners, have also made significant advances in their nuclear programs.[51] Complaining that nuclear-armed nations retain an unacceptable monopoly on nuclear weapons, Turkish President Recep Tayyip Erdogan had seemingly suggested that his nation acquire its own nuclear arsenal, even though Turkey has signed the NPT as a non-nuclear-weapon state in 1980, meaning that Ankara agreed to forgo developing or acquiring nuclear weapons, as well as the 1996 Comprehensive Test Ban Treaty,

[50] Xijin, Hu. China needs to increase nuclear capacity to maintain minimum deterrence against rising US coercion. *Global Times*. 2021.

[51] Solomon, Jay. What Happens When Everyone's Trying to Get Nukes? *The Washington Institute for Near East Policy*. 2019.

which bans all nuclear test explosions.[52] The kingdom's *de facto* leader, Crown Prince Mohammed bin Salman, has also publicly declared his intention to pursue nuclear weapons if Iran gets them first, where there are growing concerns over the nuclearisation of the Arabian Peninsula and where it could lead the Gulf and the Middle East – a volatile region that experts warn could be opening itself up to superpower proxy fights on a nuclear scale.[53] With the emergence of new NWS, nuclear conflicts would significantly destabilize international relations dynamics. Transnational NBST demonstrations between NWS, as well as NNWS displaying nuclear aspirations would be exceedingly likely in such scenario.

Table 12: Statistical Package Output for the Simple Linear Regression Model

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0,52493024							
R Square	0,27555176							
Adjusted R Square	0,17205916							
Standard Error	0,12212019							
Observations	9							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0,039707156	0,03970716	2,66252607	0,146757494			
Residual	7	0,104393379	0,01491334					
Total	8	0,144100536						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,2346467	0,04773089	4,91603451	0,00172139	0,121781083	0,34751232	0,12178108	0,34751232
Nuclear Stockpile	-2,7872E-05	1,70816E-05	-1,63172488	0,14675749	-6,8264E-05	1,2519E-05	-6,8264E-05	1,2519E-05

Let us briefly analyze some of the essential pivot table values in order to review the validity of the simple linear regression as yet performed:

- The *"Multiple R"* value of 0.52 indicates that the linear relationship, i.e. the correlation between *X* and *Y* variables is fairly strong;
- The *"R Square"* value of 0.27 estimated in percentage – 27% of the variance in NWS' PowerIndex can be accounted for by NWS' total nuclear weapons inventory, while the remaining 73% of the variance is caused by other factors, such as measurement errors;

[52] Bugos, Shannon. Turkey Shows Nuclear Weapons Interest. *Arms Control Association*. 2019.
[53] Sabga, Patricia. Nuclear Gulf: Is Saudi Arabia pushing itself into a nuclear trap? *Aljazeera*. 2020.

- The *"Standard Error"* value of 0.1221 indicates the average distance from which our observed values fall from the regression line, where the amount of value is slightly smaller than the majority of values, expressing an approximate neutrality regarding the precision of the linear regression model;
- The *"Significance F"* value of 0.15 indicates that the alternative hypothesis is proven correct ($0.15 < 0.21$), hence, the performed linear regression model is reasonably notable;
- The *"P-value"* requires an additional (yet interrelated) set of an alternative and null hypothesis concerning the variables' relationship, namely the **Alternative Hypothesis** (the slope/intercept $\neq 0$) and the **Null Hypothesis** (the slope/intercept = 0), where the former is proven correct ($0.00 / 0.15 < 0.21$) – NWS' total nuclear weapons inventory is a significant variable that impacts NWS' PowerIndex;

Although simple linear regression analyses serve as predicting models, measurement errors are always expected, especially concerning the involvement of nuclear weapons in international relations dynamics. Since we are only using NWS' total inventory to predict their military strength rank, multiple variables might also impact the dependent variable *Y*. Equation (1) considers the "ε" (prediction error/residual) component, referring to so-called "deviations" that equate to various circumstances that may occur and every NWS has its own residual, those being the vertical distances of their points to the regression line, as visually discerned in the scatter plot. The majority of the data, as previously mentioned, does not exactly fit through the regression line, where points representing the values of weaker NWS grow further away from the regression line and vice versa – stronger NWS grow closer to the regression line. The largest prediction error within the scatter plot occurs when $X = 45$ (North Korea), while the smallest prediction error occurs when $X = 6257$ (Russia). This indicates that weaker NWS might manifest other individual factors (represented as variables) for increasing their military strength rank, than stronger NWS which already manifest the highest military strength ranks. In order to estimate the residuals, $\hat{Y}$ (the predicted values of *Y*) must be found, nevertheless. While

equation (1) depicted the standard regression model components, we apply the appropriate regression equation (2)[54], consecutively managing to mathematically forecast $\hat{Y}$ values:

$$\hat{y} = b_0 + b_1 x \tag{2}$$

Table 13: Estimated Mean Values

NWS	X	Y	X-X̄	Y-Ȳ	(X-X̄)(Y-Ȳ)	(X-X̄)²
United States	5550	0.0718	4,237	-0.10278	-435	17,952,169
Russia	6257	0.0791	4,944	-0.09548	-427	24,443,136
United Kingdom	225	0.1997	-1,088	0.02512	-27	1,183,744
France	290	0.1681	-1,023	-0.00648	7	1,046,529
China	350	0.0854	-963	-0.08918	86	927,369
India	160	0.1207	-1,153	-0.05388	62	1,329,409
Pakistan	165	0.2073	-1,148	0.03272	-38	1,317,904
Israel	90	0.3464	-1,223	0.17182	-210	1,495,729
North Korea	45	0.4673	-1,268	0.29272	-371	1,607,824
Σ	**13,132**	**1.7458**	-	-	**-1,398**	**51,303,813**
Mean	**1,313**	**0.17458**	-	-	-	-

However, in order to obtain $\hat{Y}$ values, the $\mathbf{b_0}$ and $\mathbf{b_1}$ components must be estimated prior to the application of equation (2). The mean values previously calculated in Table 13 assist the implementation of the following equations, where equation (3)[55] is applied to estimate the value of b_1:

$$b_1 = \frac{\sum_{i=1}^{n}\left((x_i - \bar{x})(y_i - \bar{y})\right)}{\sum_{i=1}^{n}(x_i - \bar{x})^2} \tag{3}$$

, and equation (4)[56] is applied to estimate the value of b_0:

$$b_0 = \bar{y} - b_1 \bar{x} \tag{4}$$

[54] Natural Resources Biometrics. Chapter 7: Correlation and Simple Linear Regression. *Natural Resources Biometrics*. n.d.
[55] Ganter, Phil. Regression and Correlation. *Tennessee State University*. 2011.
[56] Ganter, Phil. Regression and Correlation. *Tennessee State University*. 2011.

Once we have estimated both the values of $\mathbf{b_0}$ and $\mathbf{b_1}$, we obtain the results regarding the Predicted Value of *Y* per NWS by implementing equation (2) for each value of the dependent variable *Y.* The calculated results regarding the predicted value of *Y* per NWS are presented in Table 14 below.

Table 14: Calculated Results regarding the Predicted Value of *Y* per NWS

NWS	Ŷ (Predicted Value of Y)
United States	0.0435
Russia	0.02229
United Kingdom	0.20325
France	0.2013
China	0.1995
India	0.2052
Pakistan	0.20505
Israel	0.2073
North Korea	0.20865

Although $\boldsymbol{SS_{(residuals)}}$ represent the sum of squares due to regression derived by applying equation (5),[57] as seen from the mathematical formula:

$$SS_{(residuals)} = \sum_{i=1}^{n} (y_i - \hat{y}_i)^2 \tag{5}$$

, we conduct an accurate evaluation by analyzing the results obtained by the standard method of subtracting our original *Y* values from the predicted values of *Y* displayed in the ($Y - \hat{Y}$) column regarding Table 15 below:

[57] Ganter, Phil. Regression and Correlation. *Tennessee State University*. 2011.

Table 15: Estimated Residuals

NWS	Y	$\hat{Y}$	$Y - \hat{Y}$	$(Y - \hat{Y})^2$
United States	0.0718	0.0435	0.0283	0.0008
Russia	0.0791	0.02229	0.05681	0.0032
United Kingdom	0.1997	0.20325	-0.00355	0.000012
France	0.1681	0.2013	-0.0332	0.0011
China	0.0854	0.1995	-0.1141	0.0130
India	0.1207	0.2052	-0.0845	0.0071
Pakistan	0.2073	0.20505	0.00225	0.000005
Israel	0.3464	0.2073	0.1391	0.0193
North Korea	0.4673	0.20865	0.25865	0.0669
Σ	-	-	**0.24976**	**0.111417**

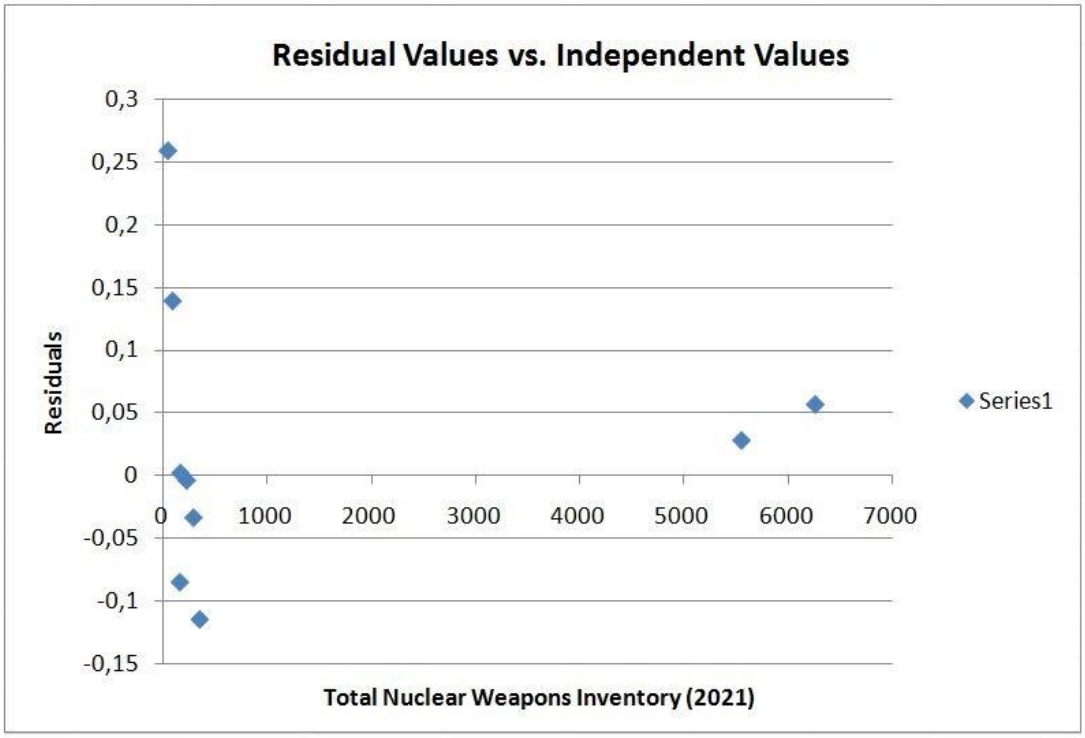
Obtained residuals displayed in the fourth column regarding Table 15, notably consist of both positive and negative values. Namely, the United States, Russia, Pakistan, Israel and North Korea manifest positive values, while the United Kingdom, France, China and India manifest negative values. The original values for the United States, Russia, Pakistan, Israel and North Korea are actually more than the predicted values, meaning that the NWS concerned would have a higher PowerIndex than it was predicted. On the other hand, the original values for the United Kingdom, France, China and India are actually less than the predicted values, meaning that the NWS concerned would have a lower PowerIndex than it was predicted. Generally taken, however, none of the values, both positive and negative do not drastically differ but, in fact, are less than 1 (for positive values) and more than -1 (for negative values), indicating that the prediction-related deviations are not substantial. Simply put, values generally being approximate to zero indicate that the predictions are fairly accurate. What this further indicates for transnational NBST demonstrations is that its likelihood of occurrence increases as a response to states expressing and realizing their nuclear aspirations being opposed rival NWS and NNWS.

Table 16: Given Values of Variables *X* and *Y-Ŷ*

Subject: Nuclear Weapon States	Independent Variable (X): Total Inventory (2021)	Prediction Error/ Residual (ε):
United States	5550	0.0283
Russia	6257	0.05681
United Kingdom	225	-0.00355
France	290	-0.0332
China	350	-0.1141
India	160	-0.0845
Pakistan	165	0.00225
Israel	90	0.1391
North Korea	45	0.25865

With the values of both the independent variable *X* and the predicted error/residual ε numerically presented in Table 16, we are able to create a supplementary "Residuals vs. Fitted" scatter plot which, when compared to the primary scatter plot, seems to display the NWS' points' identical locations.

Figure 5: Residual Plot regarding Values for the *X* variable and Prediction Error/Residual Values



Regarding the *Y*-axis in particular, even though both scatter plots manifest different ranges of values, the overall pattern remains homogenous, mainly due to the manifestation of a single independent *X* variable (the NWS' total nuclear weapons inventory for 2021) present in both scatter plots. In other words, the fits, conventionally represented by equation (6)[58], only manage to demonstrate the linear function of the independent *X* variable:

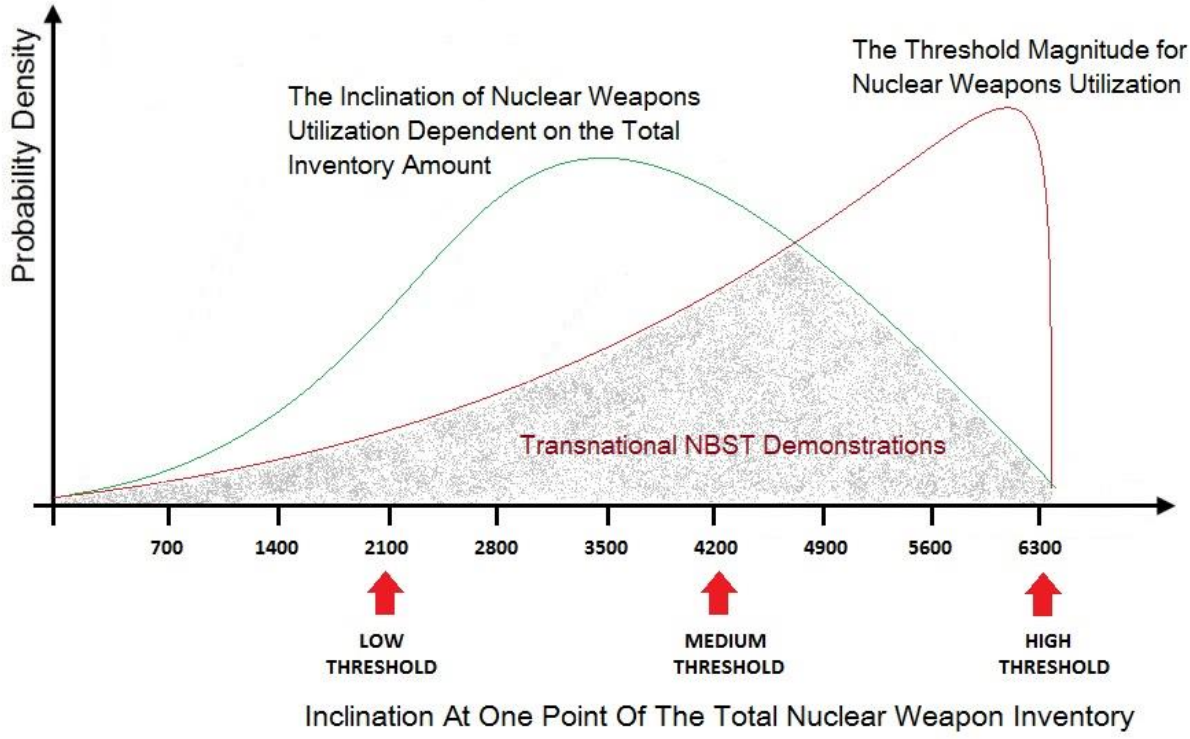
$$\hat{Y} = \hat{\beta}_0 + \hat{\beta}_1 x \tag{6}$$

If we were to conduct a multiple linear regression analysis with several predictor variables, then the supplementary "Residuals vs. Fitted" scatter plot would likely display a different pattern between the given values, depending on the specific independent *X* variables separately utilized, but more importantly, it would evince the existence and influence intensity of those predictor variables, which do not necessarily focus of the "Total Nuclear Weapons Inventory on NWS' Military Strength" relationship. Hence, a supplementary "Residuals vs. Fitted" scatter plot regarding the second simple linear regression analysis will not be presented;

Based on selected variables utilized for the currently performed simple linear regression analysis, as well as supporting geopolitical occurrences among NWS, we are able to predict transnational NBST demonstrations by modeling an illustrative adaptation sketch of NWS' inclination and threshold regarding total nuclear weapon inventory amounts, where NWS increasing the number of nuclear weapons is perceived as a major threat between them.

[58] Mathematics Stack Exchange. Residuals vs fits Plot. *Mathematics Stack Exchange*. 2017.

Figure 6: Adapted Illustration Sketch of Probability Distributions of NWS' Inclination of Nuclear Weapons Utilization



The adapted illustration sketch only addresses NWS individually, as every NWS' levels of inclination and threshold magnitude regarding nuclear weapons utilization understandably differs. Emphasizing NWS' total nuclear weapon inventory as the dominant points of value, the inclination of nuclear weapons utilization dependent on the total nuclear weapon inventory amount (notated by the green line) manifests a constructive correlation with the threshold magnitude for nuclear weapons utilization (notated by the red line), which is categorized as follows: (a) *low threshold*; (b) *medium threshold*; and (c) *high threshold*; Although the majority of NWS currently possess total inventory amounts below the low threshold value (< 2100), the overall threshold magnitude is based on an approximation of points of value possessed by the U.S. and Russia, as well as interrelated with the influence of the total inventory amount upon the PowerIndex. Hence, at a given point of the total inventory, both the NWS' level of inclination and threshold magnitude are expected to be within an approximate range;

Continuing with *domestic NBST demonstrations*, such are speculated to include the threat or conduct of radioactive/nuclear attacks perpetrated by domestic terrorist groups of either NWS or NNWS during peacetime, while simultaneously being supported by NWS adversaries. U.S. far-right extremist groups, for example, have a history of attempted procurement of nuclear weapons and radiological materials to use against the federal government. Members of neo-Nazi groups such as Atomwaffen Division, which literally means "atomic weapons" in German, and the National Socialist Movement have attempted in the past to access nuclear materials with the intent to cause harm.[59] The most difficult hurdle for a terrorist organization is the procurement of nuclear fuel – plutonium or highly enriched uranium (HEU). On the other hand, a concerning factuality addresses the "simplicity" of the use or threat of use of violence through radioactive means in order to achieve political objectives, because when considering public knowledge about dirty bombs, there are a lot of misconceptions. The acceptance of radioactive/nuclear resources supplied by foreign NWS adversaries would, nevertheless, represent domestic manifestations since they are performed by domestic terrorist groups. For that matter, we conceptualize *Nuclear-Based State-Sponsored Terrorism* (NBSST), primarily based upon two major factors: (a) *type of weapon* and (b) *subject of target*. Taking U.S. far-right extremist groups once again as a basic example, it can be noted that groups who manifest both values with (1), according to Table 17, are the most potential candidates. Domestic terrorist groups which had largely utilized bombings as weapons and had simultaneously included government-related goals are more likely to obtain nuclear and/or radioactive weapons from foreign NWS adversaries and vice versa, domestic terrorist groups which had negligibly utilized bombings as weapons and had not simultaneously included government-related goals are less likely to obtain nuclear and/or radioactive weapons from foreign NWS adversaries.

[59] Sarkar, Jayita. It's Time to Seriously Take Domestic Nuclear Terrorism Seriously. *Belfer Center*. 2021.

Table 17: U.S. Far-Right Extremist Groups

U.S. Far-Right Extremist Groups	Type of Weapon:	Subject of Target:
Alpha 66	1	1
Animal Liberation	1	0
Army of God	1	0
Aryan Nations	0	0
Atomwaffen Division	1	1
Jewish Defense League	0	0
Ku Klux Klan	1	0

***Note:** values expressed in the "Type of Weapon" column indicate (non)bombing methods, where (1) mean 'Yes', while values expressed with (2) mean 'No'; values expressed in the "Target" column indicate (non)government targets, where (1) means 'Yes' and (2) means 'No';*

Subsequently, foreign NWS adversaries' motivations of supplying domestic terrorist groups would also primarily involve destructively oriented political objectives toward NNWS or rival NWS. Within the geopolitical scope, certain domestic terrorist groups abruptly obtaining WMD such as nuclear weapons raises high suspicions, as the victimized state could immediately blame their rival NWS adversaries as responsible for NBSST, further leading to serious international conflicts. Because a dirty bomb is relatively easy to construct, its use is more likely than a nuclear weapon. It would not result in large numbers of deaths or injuries, but the consequences would still be serious: large-scale economic costs stemming from cleanup and inability to use the affected area for years, environmental damage, and psychological terror.[60] Remembering that domestic terrorism is not necessarily conducted for the purpose of causing destruction, but rather to serve as a psychological weapon, RDDs are the perfect tool for stirring radiophobia among the public. In correspondence to domestic terrorist groups' unsuccessful attempts to obtain nuclear weapons, as well as NWS adversaries' destructively oriented political objectives toward NNWS or rival NWS, the main objective of this simple linear regression analysis is to establish whether the relationship between the NWS' Composite Index of National Capability (the dependent variable – *Y*) and the Nuclear Security Index (the

[60] Nuclear Threat Initiative. About the NTI Index and the Radioactive Source Security Assessment. *Nuclear Threat Initiative*. (n.d.)

independent variable – *X*) is negative or positive, as well as to attempt to predict domestic NBST demonstrations as an outcome of such relationship. Observations derived from such relationship are perceived to affect NWS' relations with other states, including rival NWS in particular. Synonymously, we set an alternative and null hypothesis concerning the variables' relationship:

- **Alternative Hypothesis (P ≤ (-1.06))** – *the nuclear security index does influence NWS' composite index of national capability;*
- **Null Hypothesis (P > (-1.06))** – *the nuclear security index does not influence NWS' composite index of national capability;*

Values of both *X* and *Y* is numerically displayed in Table 18 below, respectively:

Table 18: Given Values for Variables *X* and *Y*

Subject: Nuclear Weapon States	Independent Variable (X): Nuclear Security Index (2020)	Dependent Variable (Y): Composite Index of National Capability (2021)
United States	76	0,198566
Russia	57	0,039274
United Kingdom	76	0,021158
France	69	0,018924
China	65	0,142149
India	41	0,073444
Pakistan	47	0,013772
Israel	57	0,003638
North Korea	19	0,012925

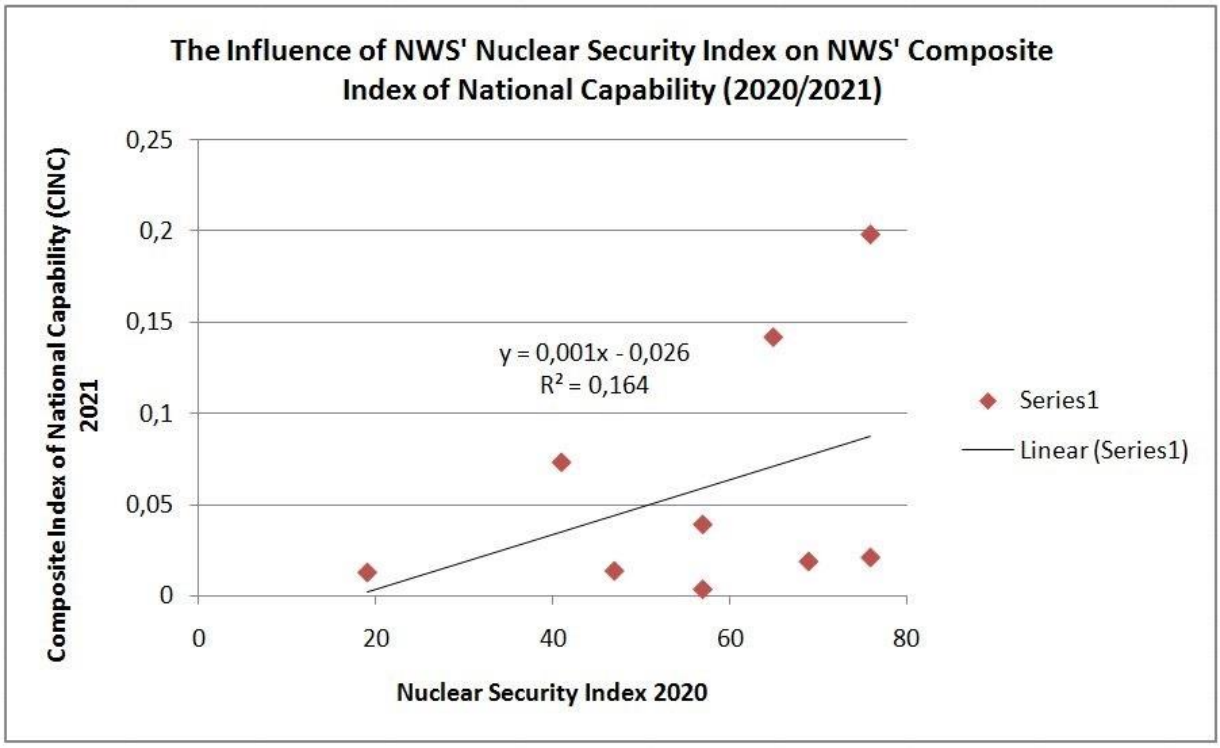
***Note:** The NTI's "Nuclear Security Index" is subsidiarily considered in relation to the new Radioactive Source Security Assessment which does not currently rank countries. More explicit analyses may be further conducted if the NTI potentially expands the concerning assessment;*

While the *Y* data are taken from The Correlates of War Project's National Military Capabilities (v4.0) Database[61], the *X* data are taken from the latest Nuclear Threat Initiative's (NTI) Nuclear Security Index for countries with weapon-usable nuclear materials worldwide in 2020. The five key factors the Index evaluated are (1) *quantities and sites*, (2) *security and control measures*,

[61] The Correlates of War Project. National Military Capabilities (v4.0). *The Correlates of War Project*. (n.d.)

(3) *global norms*, (4) *domestic commitments and capacity* and (5) *societal factors*.[62] The standard regression model components are pragmatically set out in the scatter plot below, describing their linear relationship.

Figure 7: Scatter Plot of the Influence of NWS' Nuclear Security Index on NWS' Composite Index of National Capability (CINC) for 2020/2021



The scatter plot displays the regression line sloping upwards, portraying the positive relationship between *X* and *Y*, where as the *X* values increase, the *Y* values also increase by a constant amount – the larger the nuclear security index, the larger the composite index of national capability. The positive relationship obtained amounts to the significant number of NWS manifesting a constructive correlation between their nuclear security index and their composite index of national capability. This indicates that the majority of the data only partially fits through the regression line, regarding the relationship between NWS' nuclear security and

[62] Statista. Nuclear Security Index for countries with weapon-usable nuclear materials worldwide in 2020. *Statista.* 2021.

national capacity, where despite the height of their index values, countries representing the closest points to the regression line are less likely to issue nuclear-related threats and attacks, including domestic NBST demonstrations, while countries representing the furthest points to the regression line are more likely to do so. We identify the two closest points to the regression line, those being North Korea (19, 0.012925) and Russia (57, 0.039274), as well as the two farthest points to the regression line, those being the United States (76, 0.198566) and China (65, 0.142149). Addressing the latter deviations, we consider the current nuclear competition between the U.S. and China, particularly triggered by China's anomalous nuclear strategy, where in the barren desert 1,200 miles west of Beijing, the Chinese government is digging a new field of what appears to be 110 silos for launching nuclear missiles. It may signify a vast expansion of China's nuclear arsenal — the cravings of an economic and technological superpower to show that, after decades of restraint, it is ready to wield an arsenal the size of Washington's, or Moscow's. U.S. political and economic elites clearly feel threatened by China's modest success and seem frustrated their Chinese counterparts pulled it off while remaining true to their communist roots.[63] Generally noted, the U.S. would undoubtedly want to retain its hegemonic position and globally manifest unipolarity while being ranked as the most powerful NWS. On the other hand, China considers that now would be the perfect time to attempt to become a rival superpower to the U.S., while globally imposing manifestations of bipolarity. For that matter, both countries, for that matter, seem prepared to utilize all means necessary – including their growing nuclear potentials – in order to prevent the disturbance of the power balance within the international system. However, if either the U.S. or China publicly issue nuclear threats toward each other, they significant decrease their nuclear security index, as well as their composite index of national capability in terms of value. National destabilizing rival NWS may be achieved with domestic NBST demonstrations, under the circumstance of supplied radioactive/nuclear resources not being traced back to the country of origin. The dominant factor influencing deviations in the linear relationship in our case is national economic strength, which is why the points representing the values of U.S. and China are the farthest from the

[63] Kulacki, Gregory. China Joins the New Nuclear Arms Race with Hundreds of New Missile Silos. *All Things Nuclear.* 2021.

regression line, despite their notably high indexes for both nuclear safety and national capacity; The low deviations of point representing the values of North Korea and Russia from the regression line show that neither Russia nor North Korea currently possesses economic capacities strong enough to yet represent a significant threat to the U.S. and China, which is considered a disadvantage. This does not stop the U.S. and China to apply softer strategies toward weaker nuclear rivals, since both share strategic interests of North Korea's denuclearization. Since Russia and North Korea are currently in unthreatening economic positions, they would expectedly utilize nuclear potentials for defensive, rather than for offensive purposes. And by internationally demonstrating their determination not to engage into issuing nuclear threats or attacks, their nuclear security and national capability indexes would only rise and strengthen, which is why their points of value are closest to the regression line.

Table 19: Statistical Package Output for the Simple Linear Regression Model

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0,40528076
R Square	0,16425249
Adjusted R Square	0,04485999
Standard Error	0,066694
Observations	9

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,006119394	0,00611939	1,37573542	0,279191879
Residual	7	0,031136626	0,00444809		
Total	8	0,03725602			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	-0,02619722	0,07531553	-0,34783293	0,73819054	-0,20429015	0,15189571	-0,20429015	0,15189571
Nuclear Security Index	0,00149827	0,001277391	1,17291748	0,27919188	-0,00152228	0,00451882	-0,00152228	0,00451882

Let us briefly analyze some of the essential pivot table values in order to review the validity of the simple linear regression as yet performed:

- The *"Multiple R"* value of 0.40 indicates that the linear relationship, i.e. the correlation between *X* and *Y* variables are fairly strong, generally speaking;

- The *"R Square"* value of 0.16 estimated in percentage – 16% percent of the variance in NWS' Composite Index of National Capability (CINC) can be accounted for by NWS' Nuclear Security Index, while the remaining 84 % of the variance is caused by other factors, including measurement errors;
- The *"Standard Error"* value of 0.066694 indicates the average distance from which our observed values fall from the regression line, where the amount of value is slightly smaller than the majority of values, expressing an approximate neutrality regarding the precision of the linear regression model;
- The *"Significance F"* value of 0.28 indicates that the null hypothesis is proven correct ($0.28 > (-1.06)$), meaning that the performed linear regression is not necessarily notably, given that measurement errors such as national economic strength;
- The *"P-value"* requires an additional (yet interrelated) set of an alternative and null hypothesis in relation to the variables' relationship, namely the **Alternative Hypothesis** (the slope/intercept $\neq 0$) and the **Null Hypothesis** (the slope/intercept = 0), where the latter is proven correct ($0.74 / 0.28 > (-1.06)$) – NWS' nuclear security is not necessarily always the dominant variable that impacts NWS' composite index of national capability.

Since we are only using NWS' nuclear security index to predict the composite index of national capability, measurement error are expected. As multiple variables might influence NWS' composite index of national capability, equation (1) considers the "ε" component with particular focus toward national economic strength. Since every NWS has its own residual and the majority of the data only partially fits through the regression line, the largest prediction error occurs when X = 76 (the United States), while the smallest prediction error occurs when X = 19 (North Korea). This indicates that points representing the values of dominant NWS and continuously developing NWS (including economic, military and technological aspects) grow further away from the regression line and vice versa – currently less developing NWS (including economic, military and technological aspects) grow closer to the regression line. In order to estimate the residuals, $\hat{Y}$ (the predicted values of Y) must be found.

Table 20: Estimated Mean Values

NWS	X	Y	X-X̄	Y-Ȳ	(X-X̄)(Y-Ȳ)	(X-X̄)²
United States	76	0.198566	25,3	0.146181	3.6983793	640.09
Russia	57	0.039274	6,3	-0.013111	-0.0825993	39.69
United Kingdom	76	0.021158	25,3	-0.031227	-0.7900431	640.09
France	69	0.018924	18,3	-0.033461	-0.6123363	334.89
China	65	0.142149	14,3	0.089764	1.2836252	204.49
India	41	0.073444	-9,7	0.021059	-0.2042723	94.09
Pakistan	47	0.013772	-3,7	-0.038613	0.1428681	13.69
Israel	57	0.003638	6,3	-0.048747	-0.3071061	39.69
North Korea	19	0.012925	-31,7	-0.03946	1.250882	1.005
Σ	**507**	**0.52385**	**-**	**-**	**4.38**	**2008**
Mean	**50.7**	**0.052385**	**-**	**-**	**-**	**-**

In order to obtain $\hat{Y}$ values, the $\mathbf{b_0}$ and $\mathbf{b_1}$ components are estimated prior to the application of equation (2). The mean values previously calculated in Table 20 assist the implementation of equations (3) and (4). Once we have estimated both the values of $\mathbf{b_0}$ and $\mathbf{b_1}$, we obtain the results regarding the Predicted Value of *Y* per NWS by implementing equation (2) for each value of the dependent variable *Y*, which are presented in Table 21 below.

Table 21: Calculated Results regarding the Predicted Value of *Y* per NWS

NWS	Ŷ (Predicted Value of Y)
United States	0.6086
Russia	0.1906
United Kingdom	0.6086
France	0.4546
China	0.3666
India	-0.1614
Pakistan	-0.0294
Israel	0.1906
North Korea	-0.6454

Although $\boldsymbol{SS_{(residuals)}}$ represent the sum of squares due to regression derived by applying equation (5), we are able to conduct an accurate evaluation by analyzing the results obtained by the standard method of subtracting our original *Y* values from the predicted values of *Y* displayed in the (Y - Ŷ) column regarding Table 22 below.

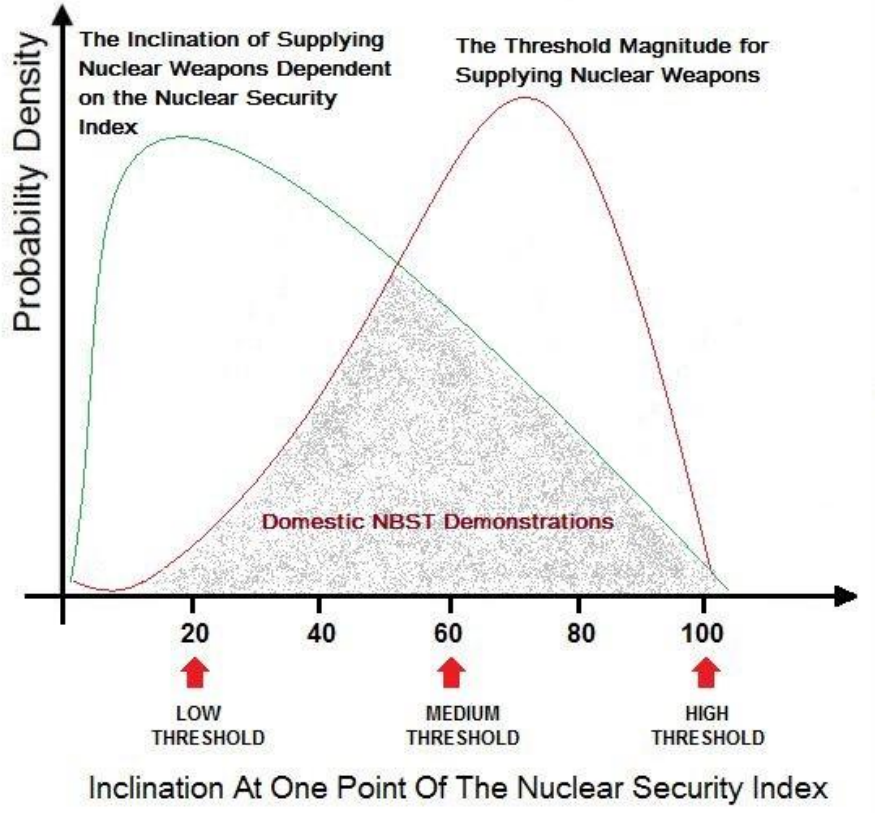
Table 22: Estimated Residuals

NWS	Y	$\hat{Y}$	$Y - \hat{Y}$	$(Y - \hat{Y})^2$
United States	0.198566	0.6086	-0.410034	0.1681278812
Russia	0.039274	0.1906	-0.151326	0.0228995583
United Kingdom	0.021158	0.6086	-0.587442	0.3450881034
France	0.018924	0.4546	-0.435676	-0.189813577
China	0.142149	0.3666	-0.224451	0.0503782514
India	0.073444	-0.1614	0.234844	0.0551517043
Pakistan	0.013772	-0.0294	0.043172	0.0018638216
Israel	0.003638	0.1906	-0.186962	0.0349547894
North Korea	0.012925	-0.6454	0.658325	0.4333918056
Σ	**-**	**-**	**-1.05955**	**0.9220423382**

The obtained results displayed in the fourth column regarding Table 24, notably consists of both positive and negative values. Namely, India, Pakistan and North Korea manifest positive values, while the United States, Russia, the United Kingdom, France, China and Israel manifest negative values. The original values for India, Pakistan and North Korea are actually more than the predicted values, meaning that the NWS concerned would have a higher composite index of national capability than it was predicted. On the other hand, the original values for the United States, Russia, the United Kingdom, France, China and Israel are actually less than the predicted values, meaning that NWS concerned would have a lower composite index of national capability than it was predicted. Generally taken, however, none of the values, both positive and negative do not drastically differ but, in fact, are less than 1 (for positive values) and more than -1 (for negative values), indicating that the prediction-related deviations are not substantial. Simply put, the values generally being approximate to zero indicate that the predictions are fairly accurate. What this indicates for domestic NBST demonstrations is that, opposite from what is generally speculated, rogue states possessing nuclear weapons do not necessarily represent a threat to global peace and security in terms of utilizing radioactive or nuclear resources for offensive purposes toward selected target-states, if given that other national strength, particularly economic, are significantly low. Based on the selected variables utilized in this simple linear regression analysis, as well as states' incompatibly divergent nuclear aspirations, we are able to predict domestic NBST demonstrations by modeling an illustrative adaptation sketch of NWS' inclination and threshold regarding the nuclear security

index, where NWS perceive rival NWS' economic, technological and military strengths as a major threat, simultaneously considering them as a both a perpetrator state and a target-state.

Figure 8: Adapted Illustration Sketch of Probability Distributions of NWS' Inclination of Supplying Nuclear Weapons



The adapted illustration sketch only addresses NWS individually, as every NWS' levels of inclination and threshold magnitude in relation to supplying nuclear weapons understandably differs. Emphasizing NWS' nuclear security index as the dominant points of value, the inclination of supplying nuclear weapons dependent on the nuclear security index (notated by the green line) manifests a constructive correlation with the threshold magnitude for supplying nuclear weapons (notated by the red line), which is categorized as follows: (a) *low threshold*; (b) *medium threshold*; and (c) *high threshold*; While the majority of NWS currently manifest a nuclear security index above the low threshold value (> 20), only the U.S., the U.K., France and China currently manifest a nuclear security index above the medium threshold value (> 60).

Under the approximated assumption that the nuclear security index does correlate with the composite index of national capacity, at a given point of the nuclear security index, both the NWS' level of inclination and threshold magnitude are expected to be within an approximate range. Even though the high threshold value theoretically manifests the most favorable nuclear materials security conditions, it would not be entirely realistic for a NWS to practically achieve;

Although our nuclear-related future cannot be completely certain, it is unavoidable to assume a multipolar nuclear arms race between three major NWS – the U.S., Russia and China, as most theorists would think. In terms of the nuclear aspect of this wider geostrategic competition, Russia is indisputably the world's top nuclear power, fielding far more and more modern operational nuclear weapons and delivery systems than the United States. In this very literal sense, Russia is far and away America's foremost nuclear competitor. At the same time, Russia is in economic decline, whereas China is on the rise, modernizing and building up all aspects of its military, including its conventional and nuclear forces.[64] According to both regression analyses conducted, however, the new era of nuclear multipolarity potentially portrayed by a second nuclear arms race would spread much further than just the great triangle between the U.S., Russia and China. With the effectiveness of the TPNW remaining questionably by NWS refusing to sign, as speculated, the emergence of new NWS being a contrasting outcome would intensify NBST demonstrations within the international community.

II.II. A Mathematical Model for Predicting Nuclear-Based State Terrorism

As a response to the new era of nuclear multipolarity, we have established NBST demonstrations as geopolitical scenarios where NWS utilize either nuclear or radioactive means for political strategy against each other or against NNWS manifesting nuclear aspirations within the second nuclear arms race. Presaging such parlous social phenomena is achieved through the method of mathematical modeling displayed by systems of differential equations, where particular NBST-related assumptions derived from both regression analyses are utilized to

[64] Cooper, David, *Arms Control for the Third Nuclear Age: Between Disarmament and Armageddon*, Washington, Georgetown University Press, 2021, p.14.

create appropriate *a priori* frameworks, whose establishment is essential for formulating the mathematical models;

Regarding *transnational NBST demonstrations*, the postulation behind the mathematical model represents the likelihood of NWS issuing nuclear threats and attacks triggered by weaker NWS' nuclear weapons buildup and corresponding fear reactions of stronger NWS. The relationship observed regards the effect of total nuclear weapons inventory upon the PowerIndex, where creating an *a priori* framework is accomplished by conjecturing the following assumptions based on the results obtained by the first simple linear regression analysis presented:

(1) The height of NWS' military strength rank;
(2) The amount of NWS' total nuclear weapons inventory;
(3) Potential NBST demonstrations resulting from NWS' reaction/fear factor;
(4) Alternative national aspects that influence NWS' military strength rank;

Because the division between NWS with high military strength ranks and NWS with low military strength ranks was observed, this system models one stronger NWS and one weaker NWS, where each differential equation corresponds to the nuclear weapons buildup dependent on the approximated threshold values:

$$\frac{dA}{dt} = rb + ja + m\left(\frac{A + \alpha_{AB} B}{N_A}\right) \tag{7}$$

$$\frac{dB}{dt} = sa + kb + n\left(\frac{B + \alpha_{BA} A}{N_B}\right) \tag{8}$$

, where:

- ***dA/dt*** and ***dB/dt*** represent the growth rates of the two NWS' military strength ranks;
- ***"A"*** represents the stronger NWS (with a higher military strength rank);
- ***"B"*** represents the weaker NWS (with a lower military strength rank);

- Solutions ***A(t)*** and ***B(t)*** represent the military strength rank for the weaker and stronger NWS at time *t*;
- "***a***" and "***b***" represent the amounts of nuclear weapons possessed by each NWS at a given time;
- "***r***" and "***s***" represent the respective NWS' reaction regarding the nuclear weapons amount possessed by the rival NWS through which transnational NBST would be demonstrated (issuing nuclear-related threats and/or attacks);
- "***j***" and "***k***" represent NWS' tendencies to increase their total nuclear weapons inventory as a response to rival NWS' total inventory;
- "***m***" and "***n***" represent exogenous factors that influence the total nuclear weapons inventory (e.g., international treaties, diplomatic pressure, economic strength decrease, etc);
- "α_{AB}" represents the effect that the weaker NWS has on the nuclear weapons amount of the stronger NWS, while "α_{BA}" represents the effect that the stronger NWS has on the nuclear weapons amount of the weaker NWS;
- "N_A" represents the nuclear capacity of the stronger NWS, while "N_B" represents the nuclear capacity of the weaker NWS;

Being adopted from the biological concept of "*Carrying Capacity*" – the carrying capacity of a biological species in an environment is the maximum population size of the species that the environment can sustain indifferently, given the food, habitat, water, and other necessities available in the environment,[65] the so-called "*Nuclear Capacity*" component in a parallel manner represent the maximum inventory size of nuclear weapons that a State can possess, given the economic, political, legal and other convenient circumstances. Simply put, nuclear capacity is defined as a state's maximum amount of nuclear weapons regarding the total inventory. With reference to the simplified Verhulst model of population dynamics,[66] an adapted mathematical formula is presented in order to calculate the total nuclear weapons inventory dynamics:

[65] Haugan, Gregory T, *Sustainable Program Management*, Boca Raton, CRC Press, 2013, p.77.
[66] Peters, Greg, and Svanström, Magdalena, *Environmental Stability for Engineers and Applied Scientists*, Cambridge University Press, 2019, p.33.

$$\frac{dI}{dt} = r\,I\left(1 - \frac{I}{N}\right) \tag{9}$$

, where:

- ***dI/dt*** represent the rate of change regarding the total nuclear weapons inventory;
- Solution ***I(t)*** represents the total nuclear weapons inventory;
- ***"r"*** represents the maximum total inventory growth;
- ***"I"*** represents the number of nuclear weapons regarding the total inventory; and
- ***"N"*** represents the nuclear capacity;

The occurring "issue" with equation (9), however, is that it only incorporates the "*Nuclear Capacity*" parameter instead of demonstrating how its value can be obtained. With regards to the components in equation (9), an emanated mathematical formula for measuring NWS' nuclear capacity is presented:

$$N = \frac{rI^2}{rI - \frac{dI}{dt}} \tag{10}$$

, where *N* is obtained by dividing the value of the maximum total inventory growth multiplied by the square of the number of nuclear weapons regarding the total inventory and value of the maximum total inventory growth multiplied by the number of nuclear weapons regarding the total inventory minus the rate of the total nuclear weapons inventory change. Be that as it may, utilizing equations (7), (8), (9) and (10) allows the practical manifestation of the comprehensive mathematical model addressing transnational NBST demonstrations.

Regarding *domestic NBST demonstrations*, the postulation behind the mathematical model represents the likelihood of the great power and the rising power to either supply their rival's domestic terrorist groups with radioactive or nuclear resources and weapons in order to undermine the psychological dimension of its national power, i.e. the rival NWS' **psychological power**, under the "trigger" of the rate of its economic strength growth. We put particular

emphasis upon the economic strength instead of military or technological strengths considering that NWS' significant economy is required to establish powerful military or technological potentials, especially if aiming toward a large nuclear weapons inventory. In any event, correlation between NWS' psychological power and domestic NBST are twofold:

- *National consequences* (the discomposing of the attacked NWS' national security and causing psychological terror among its population);
- *Global consequences* (the damaged or possibly ruined NWS' reputation as perceived by the international community);

We establish an *a priori* framework by conjecturing the following assumptions based on the residuals observed concerning the subsequent simple linear regression analysis:

(1) The estimate of NWS' psychological dimension of national power;
(2) Supplying radioactive or nuclear resources to rival states' domestic terrorist groups;
(3) Potential NBST demonstrations resulting from NWS' reaction (fear factor);
(4) Other factors that influence NWS' psychological power;

While David Jablonsky classifies the variables of national power as natural and social, the presented mathematical model considers the social variables of power, those being the State's economy, army and military capacity, political factors and psychological factors.[67] Simultaneously, the mathematical model is designed in an attempt to predict *Thucydides' Trap* – the dangerous dynamics that occur when a rising power threatens to displace a ruling power,[68] where the system of differential equations models two NWS – the great power and the rising power – which may fall during a nuclear arms race. Each differential equation corresponds to the rate of change of the given State's psychological dimension of its national power:

[67] Zarghani, Seyed H, *Measurement of National Power: Definitions, Functions, Measurement*, Saarbrücken, LAP LAMBERT Academic Publishing, 2010, p.36.
[68] Kouskouvelis, Ilias. The Thucydides Trap: A Distorted Compass. *E-International Relations*. 2017.

$$\frac{dC}{dt} = \frac{\Sigma (E_c + M_c + P_c)}{\alpha_D} + m \quad (11)$$

$$\frac{dD}{dt} = \frac{\Sigma (E_d + M_d + P_d)}{\alpha_C} + n \quad (12)$$

, where:

- ***dC/dt*** and ***dD/dt*** represent the growth rates of the two NWS' psychological dimension of national power;
- ***"C"*** represents the great power (ideally manifesting both natural and social factors regarding national power);
- ***"D"*** represents the rising power (significantly increasing both natural and social factors regarding national power, particularly emphasizing its economic strength and political influence);
- Solutions ***C(t)*** and ***D(t)*** represent the psychological power for the greater power and the rising power at time t;
- *"**E**"*, "***M***" and "***P***" represent the state's economy, military capacity and political strength, respectively;
- "α_D" represents the greater power's reaction regarding the rising power's economic strength, while "α_C" represents the rising power's reaction regarding the great power's economic strength, both through which domestic NBST would be demonstrated (supplying radioactive/nuclear weapons and materials to rival states' domestic terrorists groups);
- "***m***" and "***n***" represent other factors that influence NWS' psychological power (e.g., domestic cohesion, manner of governance, the course of foreign affairs, the state leader's notoriety, etc);

By utilizing equations (11) and (12), the practical manifestation of the comprehensive mathematical model addressing domestic NBST demonstrations is allowed.

II.III. Philosophical Constructs of Nuclear-Based State Terrorism

Philosophical concerns over nuclear armament raises questions about the logical and conceptual basis for deterrence theory as well as the effects of threats of nuclear annihilation on our common humanity.[69] In a multipolar world, tomorrow's nuclear arsenals could be managed in unpredictable ways by countries whose governments range from fragile to stable and whose approaches to international affairs range from passive to assertive to even aggressive.[70] In "Global Challenges for Leviathan," Italian political philosopher Furio Cerutti considers how the existence of nuclear weapons upends the efforts of the modern state to provide meaningful security for its citizens. What is the utility of states, Cerutti asks, when the possibility of nuclear annihilation – a possibility over which many states have no control – threatens their very existence?[71]

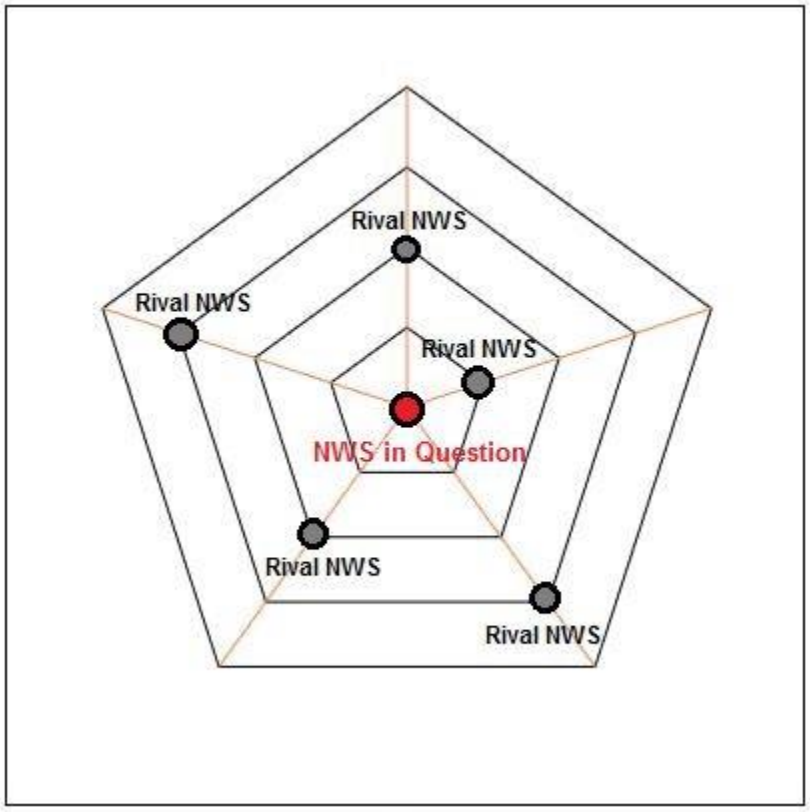
Speaking from a geostrategic perspective, the nuclear question for NWS remains approximately identical since the first regression analysis observes how nuclear aspirations manifested by weaker NWS to increase their military strength rank could trigger stronger NWS to resort to transnational NBST demonstrations, while the second regression analysis observes how great NWS and rising NWS manifesting significant economic strength could resort to domestic NBST demonstrations among themselves in order to undermine the psychological aspect of their national power, while simultaneously applying softer non-violent strategies toward NWS in relatively weak economic positions in an attempt to persuade their denuclearization.

Illustratively displayed in Figure 9, NWS' behavior under circumstances of a nuclear arms race to resort to NBST is compared to a so-called "*Orb-Weaver Spider Web*" analogy with concern to orb-weaver spiders, as they ordinarily sit in the center of their web waiting for prey. When an insect flies into the web, the orb-weaver spider senses the vibration, rushes out of from the web centre and rapidly attacks and kills the victim,[72] in order for their struggling to not cause

[69] Churchill, Robert P, "Nuclear Arms as a Philosophical and Moral Issue". *The Annals of the American Academy of Political and Social Science*. Vol.469, 1983:46.
[70] Mecklin, John. Disarm and Modernize. *Foreign Policy*. 2015.
[71] Goldblum, Bethany. Modernization, Deterrence, and Cerutti's Political Philosophy. *The Nuclear Policy Working Group*. 2015.
[72] Gray, Mike. Garden Orb Weaving Spiders. Australian Museum. 2020.

further damage to the web.[73] When food is plentiful, however, orb-weaver spiders will release large prey rather than risk a fight that may damage their web;[74]

Figure 9: Illustrative Sketch of the "Orb-Weaver Spider Web" Analogy



In an identical manner, the particular NWS in question (represented by the red dot) builds its "web" of state power in a given nuclear arms race, through nuclear weapons possession. Any other rival NWS (represented by the grey dots) whose level of nuclear weapons-related development crosses the particular NWS' "threshold", threatens its power position by figuratively "getting caught" in the spider web. The particular NWS consequently "attacks" the rival NWS by NBST demonstrations, either domestic or transnational, in order to stop the rival NWS from further "damaging" its power position. Simply put, ambitious nuclear aspirations is what contributes for rising rival NWS to "get caught" in the powerful NWS' "spider web". We notice, however, that some of the grey dots are much closer to the center than others, which

[73] Fauna Facts. Why do Spiders Sit in the Middle of their Webs? Fauna Facts. n.d.
[74] Gray, Mike. Garden Orb Weaving Spiders. Australian Museum. 2020.

indicates that those rival NWS have already crossed the particular NWS' "threshold", but are left alone due to their strength – they are much more powerful than the particular NWS in question because any NBST manifestation could potentially have a destructive result for the particular NWS in question regarding its power position in the international community. Soft non-violent strategies toward such NWS may, however, be manifested as an alternative;

Based on the "*Orb-Weaver Spider Web*" analogy, a rather controversial philosophy of NWS engaged in the current nuclear arms race is concluded under the presumption that all political action aims at either preservation or change. Despite NBST being absent of any moral justifications, stronger NWS aim to preserve their power position. Weaker NWS building up their nuclear arsenal and NNWS manifesting nuclear aspirations represent changes proved as destructive toward their power position, changes for which they are highly interested to prevent. On the other hand, weaker NWS and NNWS manifesting nuclear aspirations aim toward subjectively-constructive changes in order to improve their power position, but more importantly, to defend themselves from nuclear threats and attacks issued by stronger NWS.

II.IV. Anthropological Constructs of Nuclear-Based State Terrorism

It is becoming evident that anti-state terrorism pales into relative insignificance in size and scope against 'state terrorism' – that is, terrorism practiced by states (or governments) and their agents and allies. Many definitions, however, seek to exclude state terrorism from consideration. There is no objective justification for this, and it is a politically motivated subterfuge. Anthropologists can make a major contribution by exposing the concept of terrorism to scrutiny and by demonstrating the many social and cultural complexities underlying what is often simply telescoped into faceless 'terrorism.'[75] With nuclear weapons being an ever-present geopolitical component, it is perceptible to acknowledge mankind's existence within a "*nuclear-civilized society*" where numerous NWS take advantage of their nuclear arsenal in order to adapt international relations by their liking under the threat of mass destruction. We further comprehend the purview of a nuclear-civilized society by comparing it

[75] Sluka, Jeffrey, Chomsky, Noam, and Price, David, "What Anthropologists Should Know about the Concept of Terrorism". *Anthropology Today*. Vol.18, no.2, 2002:22.

to a social structure, which represents the property of objects, events and series of events. The constituent of an object of event exhibits the properties of the structure, which includes formal characteristic, and may be contrasted with function and with contents, material or qualitative character.[76] Dominant objects of property of a nuclear-civilized society are nuclear weapons which are shaped by both *manifest* functions and *latent* functions. Manifest functions are those objective consequences, contribution to the adjustment or adaptation of the system which are intended and recognized by participants in the system. This type of function is, therefore, known to the society, as well as the consequence which is observable and is sanctioned by the same society.[77] It goes without saying that NBST demonstrations represent criminal offences yet to be controlled by international criminal law. And crime is a prime example of the social mechanisms through which we manage inclusion and exclusion, disadvantage and entitlement. It is directly related to the distribution of worth and privilege, and is the point of departure for policing of societies and states. What is defined as criminal and how we act toward it thus clarifies fundamental aspects of governance and control.[78] Manifest functions produce criminal consequences, as highly destructive NBST outcomes should change the course of defining state terrorism in response, yet they lack to identify political NBST objectives. Manifest functions, accordingly, connect to latent functions which produce community-concerned consequences and are neither intended nor recognized.[79] Some political "qualities" postulate latent consequences as such. First, a political process is public rather than private. An activity that affects a whole community, a society or a group of societies is unquestionably a public activity.[80] Moreover, the focus on political process demands consideration of political structures as well, yet the relationship between structure and process is a particularly touchy

[76] Sharma, Ram N., and Sharma, Rajendra, K., *Anthropology*, New Delhi, Atlantic Publishers and Distributors, 1997, p.209.
[77] Sharma, Ram N., and Sharma, Rajendra, K., *Anthropology*, New Delhi, Atlantic Publishers and Distributors, 1997, p.213.
[78] Wydra, Harald and Thomassen, Bjørn. *Handbook of Political Anthropology*, Cheltenham, Edward Elgar Publishing, 2018, p.441.
[79] Sharma, Ram N., and Sharma, Rajendra, K., *Anthropology*, New Delhi, Atlantic Publishers and Distributors, 1997, p.213.
[80] Swartz, Marc J., Turner, Victor W., and Tuden, Arthur. *Political Anthropology*, New Brunswick, Transaction Publishers, 2009, p.4.

matter in political anthropology.[81] When certain individuals acting on behalf of a NWS (e.g., president, prime minister) or a small group of people (e.g., nuclear command authority, national command authority, central military commission) manifest either transnational or domestic NBST demonstrations, it is unavoidable for multiple states, besides the targeted state, to be affected by such destructive political-oriented action. Particularly when NBST demonstrations result in a widespread conflict escalation between states concerned, we perceive the transformation from a "*political event*" to a "*series of political events*", where the political gravity of NBST evolves into something much more than a simple political process, it becomes an "extra-political" structure of complex relations which have long exceeded direct political objectives. The second generally accepted quality of politics is that it concerns goals. Combining the first characteristic with this second one, we can go a bit further and say that politics always involves public goals. These goals will include the achievement of a new relationship vis-à-vis some other group or groups.[82] In this regard, they can be the most politically useful weapons a state can possess.[83] This kind of information is generally obtained through long-term close associations in a relatively small community,[84] as current NWS represent such a "relatively small community" where its limited number creates the political effectiveness of nuclear weapons possession. With new nuclear powers continuously emerging, it cannot be expected for political goals involving nuclear weapons to ever produce constructive international relations when aimed toward other nations. Crossing the line as a response to that very same credence includes NBST demonstrations among NWS representing a significantly bigger community. While more and more states strive to obtain nuclear weapons, it is further questioned as to which countries would become the next NWS. Such dilemma has been thought about before, particular considering the notorious *"Nth Country"* problem, originally referring to the Lawrence Livermore Laboratory's notorious *"Nth Country Experiment"*. At the time the project was conducted by the U.S. military in 1964, the world's

[81] Vincent, Joan. *Anthropology and Politics: Visions, Traditions, and Trends*, University of Arizona Press, 1994, p.335.

[82] Swartz, Marc J., Turner, Victor W., and Tuden, Arthur. *Political Anthropology*, New Brunswick, Transaction Publishers, 2009, p.5.

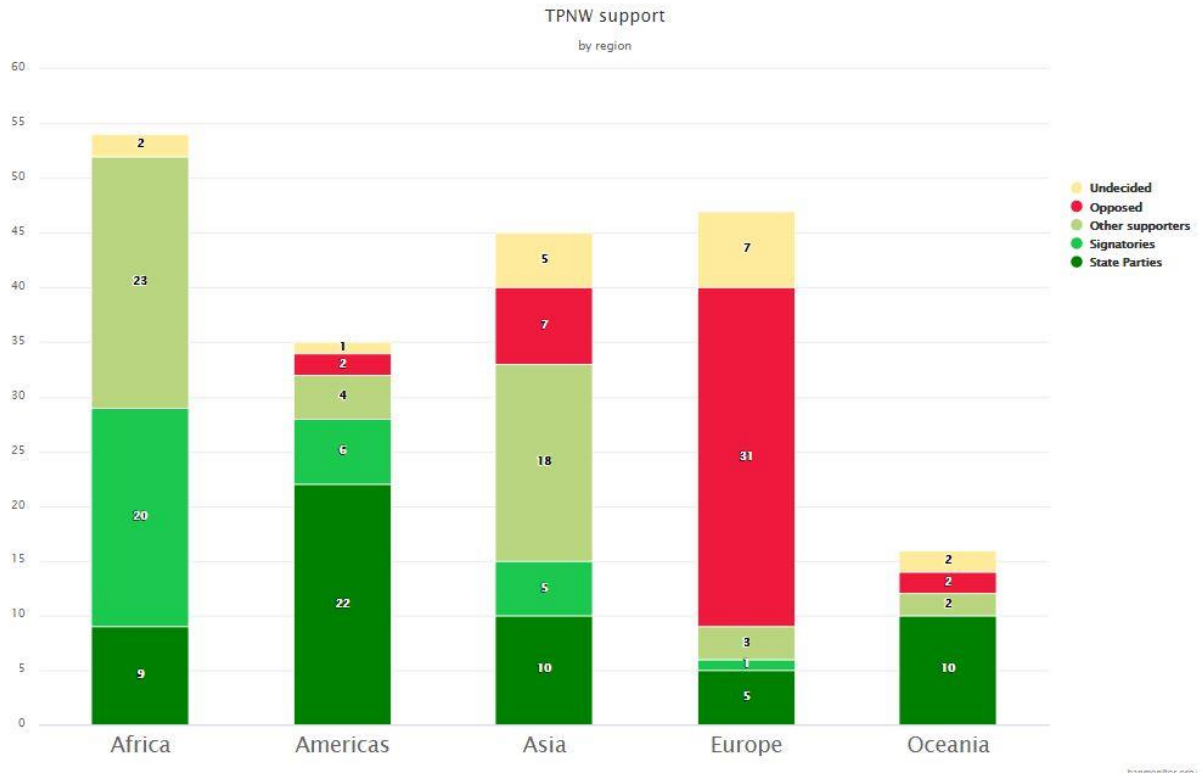
[83] Forsyth, James Wood. Nuclear Weapons and Political Behavior. *Strategic Studies Quarterly*. Vol. 11, no. 3, 2017: 115.

[84] Cohen, Ronald. Research Directions in Political Anthropology. *Canadian Journal of African Studies/Revue Canadienne Des Études Africaines*. Vol.3, no.1, 1969: 23.

only nuclear powers were Russia, the United Kingdom and the United States. The United States wanted to know how easily, if at all, another nation seeking to build a nuclear bomb could do so, working without the classified information in possession of the nuclear powers.[85] Designing a nuclear explosive device would be easier today than it was in the 1960s because the information revolution has facilitated the dissemination of knowledge, and computing tools have become much more powerful and affordable.[86] Whereas the *Nth* power viewed its own acquisition of nuclear weapons as being fully justified, the *N+1* power would probably be seen as a threat to world peace. Herman Kahn has shared the intuitive concern that the probabilities of disaster were increased as more countries gained access to nuclear capabilities and assumed that, in the absence of control, this would soon happen. These new nuclear powers would need responsible governments and sophisticated forms of crisis management, especially if the smaller nuclear powers began fighting amongst themselves.[87] Considering the TPNW's lack of legislative effectiveness, as well as the number of NNWS consequently beginning to manifest nuclear aspirations, it could be stated that Kahn's concerns have been somewhat "maximized".

[85] Diab, Robert, *The Harbinger Theory: How the Post-9/11 Emergency Became Permanent and the Case of Reform*, Oxford University Press, 2015, p.196.
[86] Goldthau, Andreas, *The Handbook of Global Energy Policy*, Malden, John Wiley and Sons, 2016, p.211.
[87] Freedman, Lawrence and Michaels, Jeffrey, *The Evolution of Nuclear Strategy: New, Updated and Completely Revised*, London, Springer, 2019, p.333.

Figure 10: TPNW Support by Region



Note. Adapted from "The Status of the TPNW" by Nuclear Weapons Ban Monitor, 2021 (https://banmonitor.org/tpnw-status) In the public domain.

According to official statistical data displayed in Figure 10, we observe current geopolitical dynamics concerning TPNW support. While Africa bears no opposition toward the TPNW, remaining continents manifest certain disapprovals. There are seven opposed states in Asia, two opposed states in both the Americas and Oceania and thirty-one in Europe, obviously having the largest number of states which disapprove of the TPNW.

Table 23: Opposed States to the TPNW

Europe	**Greenland, Island, Russia*, United Kingdom*, Norway, Estonia, Latvia, Lithuania, Poland, Germany, Czechia, France*, Denmark, Bulgaria, Spain, Netherlands, Belgium, Luxembourg, Slovakia, Hungary, Croatia, Romania, Italy, Slovenia, Bosnia and Herzegovina, Montenegro, North Macedonia, Albania, Greece, Turkey, Portugal;**
Asia	**China*, India*, Pakistan*, Israel*, Japan, North Korea*, South Korea;**
Americas	**United States*, Canada;**
Oceania	**Australia, Federated States of Micronesia;**

The "Opposed States" category consists of the nine nuclear-armed states (marked with a red asterisk in Table 23) and all of the 30 states with arrangements of extended nuclear deterrence with the United States (while, as mentioned above, the two states with arrangements of extended nuclear deterrence with Russia – Belarus and Armenia – are in the undecided category). We additionally notice that the majority of current NWS are concentrated in the Asian continent, following Europe and, lastly, the Americas. The necessity of emphasizing this statistical data reflects upon the possibility of opposed NNWS being influenced by neighboring NWS to obtain nuclear weapons, particularly when rivalry behavior is demonstrated between them.

II.V. Ethical and Legal Constructs of Nuclear-Based State Terrorism

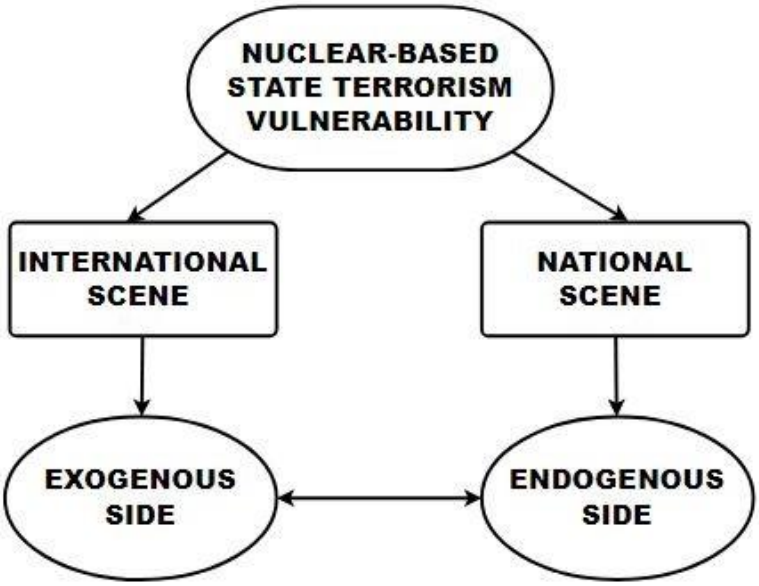
A great deal has been written about the ethics of President Harry Truman's decision to destroy the cities of Hiroshima and Nagasaki with atomic bombs. Much less attention has been given to Roosevelt's support for the use of firebombs against more than sixty Japanese cities. Those attacks subjected about a third of Japan's population to aerial bombardment and killed perhaps a million civilians. More people died during the firebombing of Tokyo in March, 1945, than during the atomic bombing of Hiroshima. According to a subsequent account by the United States Strategic Bombing Survey, "*Probably more persons lost their lives by fire at Tokyo in a 6-hour period than at any [other] time in the history of man*."[88] Despite promoting the prohibition of nuclear weapons by the TPNW, opposed NWS continue to promote their proliferation,

[88] Schlosser, Eric. The Growing Dangers of the New Nuclear-Arms Race. *The New Yorker*. 2018.

utilization and threat of utilization. Such unethical environment contemplates the factor of extremely high vulnerability, where potentially consequential mutually assured destruction (MAD) relies to vulnerability to nuclear attack, and for many this is morally wrong. How can it be right not to try to defend against nuclear weapons given the large number of causalities even a small nuclear attack would likely involve? While there are strategic reasons for this, it has been much harder to convince the public of the wisdom of vulnerability[89] and presumably refers to NBST vulnerability as well. Bearing only a slight resemblance to Bohle's claims of vulnerability having two sides – an internal side and an external side[90] – the ethical constructs of NBST can be perceived considering the analogy which demonstrates the contrast between the injury and death of an individual on one hand, and the injury and death of a nation, on the other. Namely, a human body can take just so much injury, and then the person dies. The injury that finally causes death represents more than simply an increase in the overall quantity of injury. It is the bringing about of the fundamental qualitative change from life to death. A nation can take just so much injury in war, and then it dies. It is the quantitative increase in destruction threatened by large-scale nuclear war that represents the new possibility of a mutual crossing of that qualitative threshold.[91] Considering its double structure, NBST vulnerability identifies two contrasting sides: an ***endogenous*** side considering NBST vulnerability experienced by the attacked state, including its population and the environment, and an ***exogenous*** side considering NBST vulnerability experienced on a global scale, including political and environmental aspects.

[89] Futter, Andrew, *The Politics of Nuclear Weapons: New, updated and completely revised*, Cham, Springer, 2020, p.94.
[90] Van Westen, Cees. "Vulnerability" Caribbean Handbook on Risk Information Management. n.d.
[91] Lee, Steven P, *Morality, Prudence, and Nuclear Weapons*, Cambridge University Press, 1996, p.8.

Figure 11: The Double Structure of NBST Vulnerability Framework



To begin with the ***endogenous side***, one of the best-known definitions of vulnerability was formulated by the International Strategy for Disaster Reduction (UN/ISDR). The UN/ISDR defines vulnerability as: *"The conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a community to the impacts of hazards."* In addition, the United Nations Development Programme (UNDP) defines vulnerability as: *"A human condition or process resulting from physical, social, economic and environment factors, which determine the likelihood and scale of damage from the impact of a given hazard"*[92] While both definitions mirror NBST as a simultaneous political and psychological weapon, substituting factors that are to a greater degree more felicitous, are presented, each exhibiting particularly distinguishable elements of losses. Separate types of vulnerability manifest the losses caused by NBST attacks as follows:

- **<u>Biological Vulnerability</u>:** the consequential losses reflected upon the human body, including central nervous system dysfunction, nausea, vomiting and diarrhea from damage to the gastrointestinal tract, destruction of the body's capacity to produce new

[92] Birkmann, Jörn., *Measuring vulnerability to natural hazards: Towards disaster resilient societies (second edition)*, New York, United Nations University Press, 2013, p.21.

blood cells resulting in uncontrolled bleeding[93] (nuclear weapons) or less severe injuries mainly caused by the blast (radioactive weapons);

- **Psychological Vulnerability:** the consequential losses reflected upon the human psyche, including widespread acute reactions such as psychic numbing, severe anxiety, disorganized behavior, survivor's guilt and psychosomatic reactions;[94]
- **Environmental Vulnerability:** the consequential losses reflected upon the environment, including climate change, depletion of stratospheric ozone[95], harming wildlife, contamination of air, soil, water and food production[96] (nuclear weapons);
- **Institutional Vulnerability:** the consequential damages reflected upon the targeted facilities (radioactive weapons), including infrastructure, economic activities, trade, communications, health-care facilities and schools[97], as well as other social and political disruptions (nuclear weapons);
- **Political Vulnerability:** the consequential damages reflected upon national stability and international relations, hostility and rivalry between states, the escalation of nuclear war likelihood (nuclear/radioactive weapons);

[93] The International Committee of the Red Cross, "The Effects of Nuclear Weapons upon Human Health". *The International Committee of the Red Cross*. Information Note No.1, 2013:2.
[94] Salter, Charles A, "Psychological Effects of Nuclear and Radiological Warfare". *Military Medicine*. Vol. 166, no.2, 2001:17.
[95] National Research Council, Division on Engineering and Physical Sciences, and the Committee on the Effects of Nuclear Earth-Penetration and Other Weapons, *Effects of Nuclear Earth-Penetrator and Other Weapons*, Washington, The National Academic Press, 2005, p.92.
[96] Pirolini, Alessandro. How Nuclear Warfare Affects the Environment. *AZoCleantech*. 2014.
[97] International Committee of the Red Cross. Humanitarian impacts and risks of use of nuclear weapons. *International Committee of the Red Cross*. 2020.

Table 24: Types of Vulnerability regarding Transnational and Domestic NBST Demonstrations

Biological Vulnerability	Psychological Vulnerability	Environmental Vulnerability	Institutional Vulnerability	Political Vulnerability
- Radiation Exposure **- Fatalities** **- Injuries** **- Genetic Damage** **- Cancer Induction**	**- Nucleomituphobia** **- Radiophobia** **- PTSD** **- Anxiety** **- Depression** **- Psychic Numbing** **- Survivor's Guilt** **- Psychosomatic Reactions**	**- Spread of Radiation** **- Dispersing Radioactive Particles** **- Contaminated air, soil, water and food supplies** **- Environmental Damage** **- Climate Change** **- Depletion of Stratospheric Ozone** **- Harm to Wildlife**	**- Damage to buildings and infrastructure** **- Spread of Debris** **- Social and Political Disruptions**	**- National Instability** **- Political Instability** **- Hostile Relations and Rivalry between States** **- Nuclear War Escalation**

***Note:** Domestic NBST demonstrations considers the types of vulnerability and consequential losses for both RDDs and nuclear weapons supplied by NWS, with the main difference manifested with significantly less severe consequences, generally speaking;*

As distinct from a natural disaster, a nuclear explosion which produces roughly the same amount of energy as a small volcanic eruption will not waste its power for nothing, so to speak. The main point is that any nuclear explosion is a disaster directed by people. This determines the main difference between a thermonuclear catastrophe and a natural disaster. Any natural disaster will pale into insignificance as compared with a nuclear catastrophe, because nuclear weapons will be deliberately directed at densely populated areas and industrial centers, and because nuclear weapons are designed to inflict the greatest possible damage on the enemy, to destroy his industry and cities and to wipe out his population.[98]

Continuing with the ***exogenous side***, the novel military relation of MAD is accordingly characterized as a condition of *mutual vulnerability* because each side's capacity for assured destruction entails the vulnerability of the other side to get involved into a large-scale nuclear

[98] United States Strategic Institute, *Strategic Review*, Washington, United States Strategic Institute, 1986, p.82.

war.[99] Mutual vulnerability arises from many sources, each of which has the capacity to enhance or diminish life. Sources of vulnerability include weaponry – vulnerability to mass destruction can spur cooperation or inspire a surprise attack.[100] The United States' stance against new relationships of *mutual vulnerability* with new nuclear states recalls the Cold War debate on the morality of MAD between the United States and the former Soviet Union.[101] While the U.S. government does not formally recognize mutual vulnerability with China, a 2009 Council on Foreign Relations task force on U.S. nuclear weapons policy concluded that "*mutual vulnerability with China – like mutual vulnerability with Russia – is not a policy choice to be embraced or rejected, but rather a strategic fact to be managed with priority on strategic stability*".[102] Simply put, mutual vulnerability relies on the principle of proportionality, where only NWS displaying approximately powerful nuclear arsenals have predispositions to demonstrate mutual vulnerability. While equally powerful NWS have common interests in the avoidance of nuclear war under the condition of mutual vulnerability, weaker NWS are excluded, which significantly miscalculates potential nuclear conflicts. Presuming the continuous emergence of new NWS, rather than underestimating their nuclear capacities, it is the political-strategic factor that plays a major role in international relations dynamics. Any discussion of political ethics, nevertheless, ought to rest upon some sense of what it is about the realm of politics that raises unique ethical concerns. The behavior of state leaders of NWS in relation to nuclear weapons utilization must not equate NBST as a channel to obtain a certain "common good" for the NWS in question strengthening its national or military power. The manner of how state leaders of NWS handle nuclear weapons toward other states reflects the NWS' "individualist personality", which is simultaneously subject to both ethical and legal constraints. Since law is subordinate to ethics, or, in other words, since both those who command and those who obey are bound morally to regard, in the last resort, the commands of the moral law, it follows that the ultimate end of law are suspended upon that of ethic,

[99] Lee, Steven P, *Morality, Prudence, and Nuclear Weapons*, Cambridge University Press, 1996, p.5.
[100] Clemens, Walter C, *Dynamics of International Relations: Conflict and Mutual Gain in an Era of Global Interdependence*, Lanham, Rowman & Littlefield, 2004, p.31.
[101] Doyle II, Thomas E, *Nuclear Ethics in the Twenty-First Century: Survival, Order and Justice*, London, Rowman & Littlefield, 2020, p.64.
[102] Asrar, Sarah M, *On the Horizon: A Collection of Papers from the Next Generation*, Lanham, Rowman & Littlefield, 2019, p.58.

deducible from it, justifiable by it. The logic of law is a reproduction of that of ethic, but applied to overt acts only.[103] A law in the primary sense of the term is a rule of human action prescribed by authority.[104] Political science, on the other hand, looks upon the state as a unity. When we talk of the state acting as a whole, we can only intelligibly mean the action of individuals realizing their common membership and pursuing an organized course sustained by the idea of a common good.[105] Hence, it is not unfamiliar that states themselves carry out acts designed to terrorize their own populations or those of other states, but scholars tend to avoid the label "terrorism" for such acts, preferring to call it repression or war.[106] Certain scholars, nevertheless, argue the equation of state terrorism with non-state terrorism. Walter Laqueur, for example, has argued: *"There are basic differences in motives, function and effect between oppression by the state (or society or religion) and political terrorism. To equate them, to obliterate them is to spread confusion."* Bruce Hoffman has made similar claims, by arguing that failing to differentiate between state and non-state violence, and equating the innocents killed by states and non-state actors would *"ignore the fact that, even while national armed forces have been responsible for far more death and destruction than terrorists might ever aspire to bring about, there nonetheless is a fundamental qualitative difference between the two types of violence"*.[107] Laqueur's and Hoffman's arguments, however, are limited in terms of an actor-based perspective, creating a flawed terrorism-related conception. Terrorism cannot be understood as a reference to any category of persons but is a reference to a technique, a tactic, a method involving intimidation and violence.

[103] Super, Charles W. Ethics and Law. *International Journal of Ethics*. Vol.19, no.1, 1908: 75.

[104] French, Ferdinand C. The Concept of Law in Ethics. *The Philosophical Review*. Vol.2, no.1, 1893: 35-53.

[105] MacIver, Robert M. Ethics and Politics. *International Journal of Ethics*. Vol.20, no.1, 1909:79.

[106] Goldstein, Joshua S, and Pevehouse, Jon C., *International Relations: Seventh Edition*, London, Longman Publishing, 2006, p.204.

[107] Blakeley, Ruth. State Terrorism in the Social Sciences: Theories, Methods and Concepts. In *Contemporary State Terrorism: Theory and Practice,* Richard Jackson, Eamon Murphy and Scott Poynting (eds.), 12-27. Abingdon: Routledge, 2009, p.13.

Table 25: The spectrum of (terrorist) political violence, according to R. Dekmejian

Direction of violence	*Anti state*				*State*
Magnitude	*Micro*				*Macro*
Type	Individual terrorism	Subnational terrorism	Transnational terrorism	State terrorism against domestic and transnational opponents	Politicide and genocide
Perpetrators	Assassins	Ethnic nationalists	Transnational terrorist organisations and states	Secret police	Secret police
	Bombers	Religious militants Ideological radicals Hybrid organisations		Special forces Military Paramilitaries Other state-sponsored groups	Special forces Military Paramilitaries Other state-sponsored groups

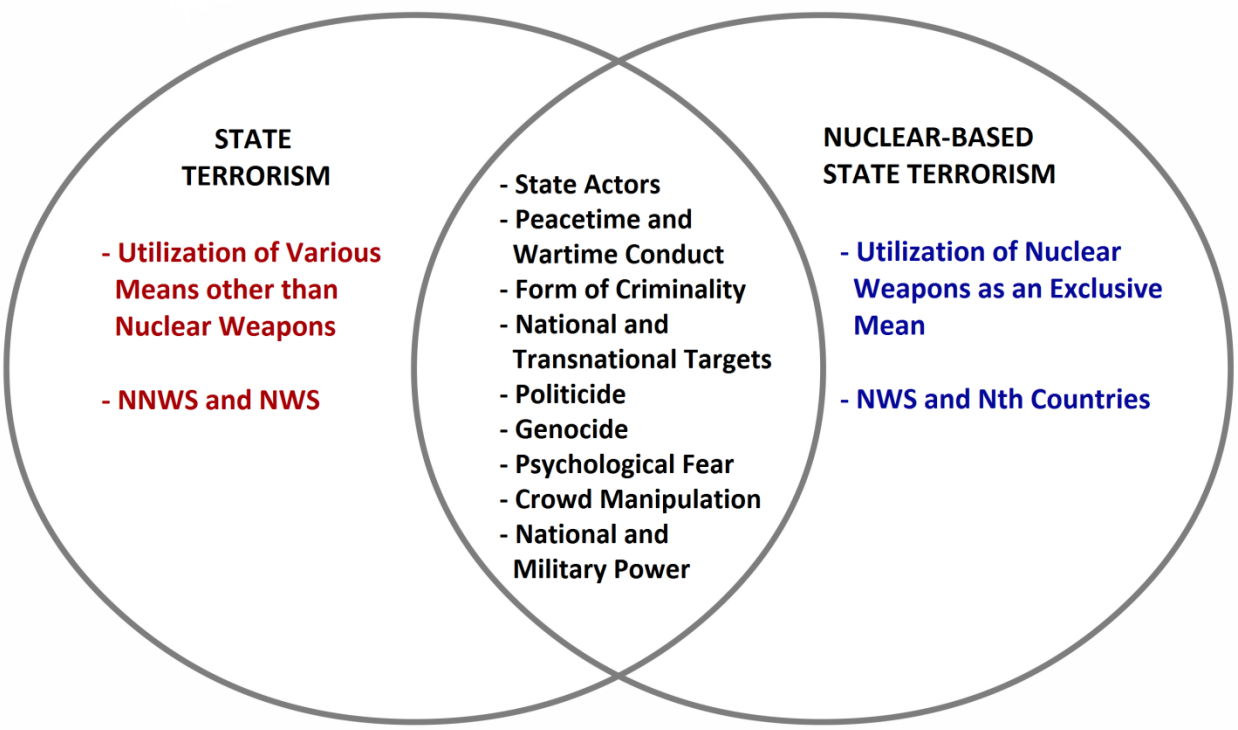
Note. Adapted from "The Routledge Handbook of Terrorism Research" (p.162), by A.P. Schmid, 2011, New York, NY: Routledge.

According to Dekmejian's spectrum, state terrorism outweighs the violence perpetrated by non-state actors, and includes state-sponsored terrorism attacking domestic and transnational targets. The most extreme form of political violence described in the spectrum is that of genocide and politicide, and is defined as being carried out by state actors.[108] Identically enough, state managers see themselves as being the only legitimate wielders of violence within the territories over which the state has jurisdiction.[109] Within this context, the methods used when perpetrating state terrorism can be divided into two categories, *legitimate* methods and *illegitimate* methods. While legitimate methods consider all types of official state action, illegitimate methods, among others, simultaneously include terror bombings (or other similar terror-inducing strategies).[110] Considering NWS' nuclear weapons stockpiles or radioactive

[108] Schmid, Alex P, *The Routledge Handbook of Terrorism Research,* New York, Routledge, 2011, p.162.
[109] Vanaik, Achin. "The Issue of Nuclear Terrorism". *Economic and Political Weekly.* Vol.45, no.17, 2010: 12.
[110] Rodriguez, Alvarez, D., *Terrorism in Practice: The Guatemalan coup d'état in 1954*, Bachelor Degree Thesis, Lund University, 2019, p.21.

resources at their disposal, illegitimate methods of state terrorism may be accordingly manifested. As political scientist Ruth Blakely notes, state terrorism is not only about the destruction of those targeted, but it is also driven by the *"opportunity afforded by the harm to terrorize others."* By the same token, state actors are, technically, in the position to cause fear and terror through utilizing radioactive resources and nuclear weapons, which is why it is necessary to theoretically recognize NBST as a particular subfield of state terrorism.

Figure 12: Similarities and Differences between State Terrorism and NBST



As displayed in Figure 12, state terrorism and NBST share multiple objectives, with the only differences being that state terrorism can also be manifested by NNWS and use other illegitimate methods (e.g., campaigns of political repression, sponsoring terrorist groups, bombings, genocide, massacres, extrajudicial killings, etc). In any event, state terrorism has been previously manifested through various means, indicating that, as NBST malefactors, NWS are likely to utilize nuclear weapons at their disposal. Nevertheless, "*Nuclear-Based State Terrorism*" is particularly challenging to nail down, although in the simplest terminology, it can be briefly defined as:

"An illegitimate method of conducting state terrorism which strongly resembles terror bombings or other similar terror-inducing strategies, characterized with the threat of or the utilization of nuclear weapons or weapons content of radioactive materials, where such conduct allows the achievement of a state's particular political, strategic or military-related objectives."

In order to recognize NBST in a more detailed manner, some key NBST elements are accordingly determined as follows:

(a) The existence of a threat or actual conduct of a nuclear attack by state authority toward foreign rival targets, either in an individual or collective manner;

(b) The threat of or actual conduct of a nuclear attack is perpetrated by an individual (e.g., president, prime minister) or a small group of people (e.g., nuclear command authority, national command authority, central military commission) acting on behalf of a NWS or an "Nth Country";

(c) The threat of or actual conduct of a nuclear attack or an attack by a weapon consisted of NWS-supplied radioactive materials is manifested with the purpose of causing severe psychological terror toward the particular population that supports and identifies with the targeted victim(s) of the nuclear attack; and

(d) The threat of or actual conduct of a nuclear attack or an attack by a weapon consisted of NWS-supplied radioactive materials which simultaneously compels a behavioral change regarding the particular population that supports and identifies with the targeted victim(s) of the nuclear attack in compliance with the NWS's or "Nth Country's" political ideology;

Despite theoretically determining some key NBST elements, there is a possibility for NBST to be confused or even equated with identical nuclear strategies. For that matter, we demonstrate a comprehensible distinction with already existing nuclear-related terms and strategies, where we differentiate "**Nuclear Warfare**" from "**Nuclear-Based State Terrorism (NBST)**" on one hand, and "**Nuclear Blackmail**" from "**Nuclear-Based State Terrorism (NBST) Threats**" on the other. The four primary theoretical components analyzed are the following:

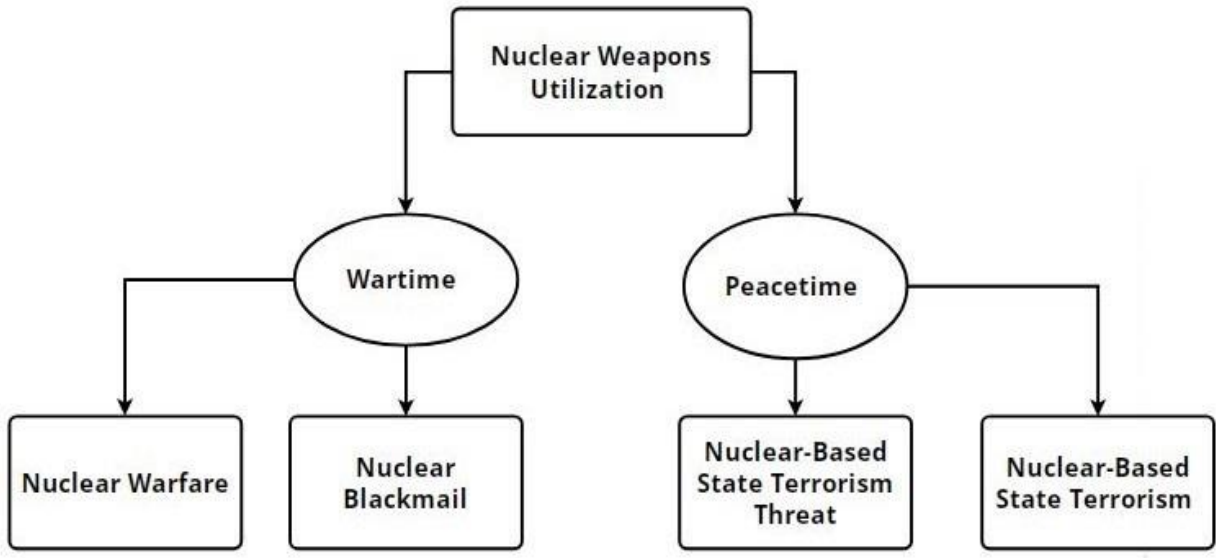
(1) ***Malefactors***, in terms of the perpetrators of the nuclear attack or an attack by a weapon consisted of NWS-supplied radioactive materials;

(2) ***Targets***, in terms of the selected victims of the NWS, where targets may vary from the state manager representing the entire nation, or a specific group of people or an influential individual;

(3) ***Objectives***, in terms of the political, military or strategic-related goals intended to be accomplished by the aggressor-NWS;

(4) ***Methods***, in terms of the type of weapons utilized by the actors (domestic terrorist groups) and/or the aggressor-NWS;

Figure 13: Nuclear Weapons Utilization during Wartime and Peacetime Flowchart



To begin with, ***nuclear warfare*** is characterized to involve the utilization of nuclear weapons during an armed conflict. This definition originates from nuclear weapons only being used by the U.S. near the end of World War II regarding the 1945 Hiroshima and Nagasaki bombings. While some scholars may attempt to portray the bombings as acts of state terrorism, nuclear warfare cannot be equated to NBST due to differentiating objectives. The most frequent justification put forward for the dropping of nuclear bombs on Hiroshima and Nagasaki referred to the allegedly ineluctable necessity to prevent the intolerably high loss of additional lives that likely was to occur in the event of ongoing Japanese aggression directed against both American

soldiers as well as towards the populations of East-Asia.[111] On the other hand, there can certainly be no denying that American authorities were conscious of the fact that the employment of atomic weapons might considerably impact upon its relations with the Soviet Union, if only because by adding such novel and powerful a tool of modern warfare to its already impressive military arsenal it would in the future have at its command a type of political leverage which in the event of growing friction between the two super powers would likely figure as a potent factor and determinant in all subsequent discussions between them.[112] Such state-conducted attack is considered a military action. Terrorism, by contrast, has been and will continue to be used as an instrument of political subversion. Terrorism is therefore one of the tactics and strategies associated with the concept of "indirect aggression" as developed by the Soviet Union and practiced by a number of states. It is "*the systematic attempt to undermine a society with the ultimate goal of causing the collapse of law and order and the loss of confidence in the state.*" Terrorism has become a major instrument in protracted political warfare that exists within an environment of neither war nor peace.[113] Under such instance, NBST would opt to achieve political goals, while not being explicitly recognized as a military action unlike nuclear warfare.

[111] Majerus, Joe, *The Decision to employ Nuclear Weapons at Hiroshima and Nagasaki*. Hamburg, Anchor Academic Publishing, 2013, p.37.
[112] Majerus, Joe, *The Decision to employ Nuclear Weapons at Hiroshima and Nagasaki*. Hamburg, Anchor Academic Publishing, 2013, p.38.
[113] Sloan, Stephen, *Beating International Terrorism – An Action Strategy for Preemption and Punishment*. Alabama, Maxwell Air Force Base, 1986, p.4.

Table 26: Nuclear Warfare vs. Nuclear-Based State Terrorism (NBST)

Components	Nuclear Warfare	Nuclear-Based State Terrorism (NBST)
Malefactors	State Actors (NWS)	- State Actors (NWS) - Nth Countries - Domestic Terrorist Groups with weapons/materials supplied by the aggressor-NWS
Targets	War Adversaries (combatants and non-combatants)	Political Opponents: - States with conflicting political ideology - Groups belonging to a political movement - Individuals directly engaged in domestic or foreign political matters - Objects manifesting conflicting political values
Objectives	- Military Strategy - Political Strategy - Nuclear Strategy - Diplomatic Power Game	- Political cleansing of population - Politicide - Genocide - Psychological Fear - Crowd Manipulation - National Power - Military Power
Methods	Utilization of nuclear weapons (strategic and tactical)	Utilization of nuclear weapons or weapons consisted of radioactive materials

According to Table 26, NBST comprehends both psychological and political objectives which may include quelling of political opposition, protecting current political systems, influencing the politics of other states or increasing national security.[114] While nuclear warfare and NBST share political objectives, the main goal of the Hiroshima and Nagasaki bombings was not to achieve

[114] Rodriguez, Alvarez, D., *Terrorism in Practice: The Guatemalan coup d'état in 1954*, Bachelor Degree Thesis, Lund University, 2019, p.20.

psychological terror upon the Japanese population. Since terrorism is directed toward the creation of a general climate of fear, it is considered a psychological weapon, for those who use it play on the most elemental fears. NBST can be describes as a *political* and *psychological* strategy. Yet, criminal aspects underlie NBST demonstrations to a great extent, specifically in terms of genocide and politicide. Genocide is routinely subsumed – erroneously – within the broad concept of 'war crimes'.[115] However, war does not always lead to genocide and genocide does not always occur in the context of war.[116] The scope of international humanitarian law is confined to international and non-international armed conflict, and the Convention clearly specifies that the crime of genocide can occur in peacetime.[117] The Genocide Convention is, hence, regarded as a "milestone in preventing genocide" due to two reasons. Firstly, the definition of genocide includes the possibility of 'peacetime genocide' and it is not limited to genocide committed during war. Secondly, it sets up a list of acts that define genocide and therefore should be prevented and punished on a legal basis.[118] This reality – that genocide can happen in times of peace – means that strategies for genocide prevention must be sensitive to a possibility of peacetime occurrence that, by definition, is not relevant for strategies of violent conflict prevention.[119] Another crucial element of NBST addresses the identification of targeted victim groups. Article II of the Genocide Convention defines genocide as any of the following acts committed with intent to destroy, in whole or in part, a national, ethnical, racial or religious group, as such:

(a) *Killing members of the group;*

(b) *Causing serious bodily or mental harm to members of the group;*

(c) *Deliberately inflicting on the group conditions of life calculated to bring about its physical destruction in whole or in part;*

(d) *Imposing measures intended to prevent births within the group;*

---

[115] Schabas, William, *Genocide in International Law: The Crime of Crimes*. Cambridge University Press, 2009, p.7.

[116] Waller, James, *Confronting Evil: Engaging Our Responsibility to Prevent Genocide*, Oxford University Press, 2016, p.138.

[117] Schabas, William, *Genocide in International Law: The Crime of Crimes*. Cambridge University Press, 2009, p.7.

[118] Henze, Tobias. *The UN Genocide Convention: An Empty Promise to Prevent Genocides After 1945?* Bachelor Thesis, Maastricht University, 2011, p.4.

[119] Waller, James, *Confronting Evil: Engaging Our Responsibility to Prevent Genocide*, Oxford University Press, 2016, p.138.

(e) *Forcibly transferring children of the group to another group;*[120]

What the Genocide Convention does not consider, however, are political groups as victims of genocide, where such act is theoretically acknowledged as "politicide". The term "politicide" was invented by Harff and Gurr (1987), who define it as a massacre of political opponents. In politicides victims are always engaged in some oppositional activity deemed undesirable by those who are in power; in genocides that may not be so.[121] This definition manifests that, within the law, such exclusion seems unfounded given that genocide and politicide share the essential criminal behavior of committing massacre. Another inadequacy regards the type of weapon utilized for NBST and its ultimate effect upon the victims. Nuclear attacks conducted by NWS address transnational NBST demonstrations, resulting in genocide. On the other hand, attacks conducted by domestic terrorist groups with radioactive means supplied by aggressor-NWS address domestic NBST demonstrations and under conditions of the explosion taking place at a government facility, political event or meeting and is strong enough to cause the death of a number of politicians, manifest high potentials for politicide. Since domestic NBST demonstrations are not always motivated by political objectives, their criminal identification is theoretically flexible. However, if presuming that domestic NBST demonstrations do manifest political objectives, certain legal loopholes would appear regardless of whether the act of politicide is successfully conducted or not. For that matter, article III of the Genocide Convention stipulates the following acts as punishable:

(a) Genocide;

(b) Conspiracy to commit genocide;

(c) Direct and public incitement to commit genocide;

(d) Attempt to commit genocide;

(e) *Complicity in genocide*;[122]

[120] United Nations. The Genocide Convention. United Nations. n.d.

[121] Smeulers, Alette, Grünfeld, Fred, *International Crimes and Other Gross Human Rights Violations: A Multi-and Interdisciplinary Textbook*, Leiden, Martinus Nijhoff Publishers, 2011, p.167.

[122] United Nations. The Genocide Convention. United Nations. n.d.

By hypothetically speculating that the Genocide Convention also addresses political groups, both domestic terrorists and NWS supplying radioactive or nuclear resources would be held responsible. It is safe to say that the vacuum of international law in regard to politicide presents one of the most neglected areas of judicial protection for universal human rights and an area which possesses the potential to make the greatest contribution to world peace through the rule of law.[123] Genocides and politicides are not accidental outcomes but are purposeful actions carried out with the explicit or tacit support of an authority group.[124] In an attempt to prove this viewpoint, we equate transnational and domestic NBST as acts of genocide and politicide, respectively, by developing two independent scenarios depicted by game theory models, either as zero-sum or non-zero-sum games, depending on NWS' set of responses. In *zero-sum games*, one player's gain is by definition equal to the other's loss, while in *non-zero-sum games*, it is possible for both players to gain (or lose). In a zero-sum game there is no point in communication or cooperation between the players because their interests are diametrically opposed. But in a non-zero-sum game, coordination of moves can maximize the total payoff to players, although each may still maneuver to gain a greater share of that total payoff.[125] The following elements are simultaneously addressed: (1) Game, (2) Players, (3) Strategy, (4) Payoff, (5) Information Set, and (6) Equilibrium;[126] Regarding the element of equilibrium, a situation in which a player will continue with their chosen strategy, having no incentive to deviate from it, after taking into consideration the opponent's strategy is identified as the "Nash Equilibrium"[127], which we identify as consequential nuclear war resulting from NBST conducted by both NWS.

- **"Transnational NBST" Game Theory Model (NWS x NWS)**

[123] Kutner, Luis. Politicide: The Necessity of an International Court of Criminal Justice. *Denver Journal of International Law & Policy*. Vol.2, no.1, 1972: 56.
[124] Anderton, Charles H., Carter, John R., *Principles of Conflict Economics: A Primer for Social Scientists*, Cambridge University Press, 2009, p.105.
[125] Goldstein, Joshua S, and Pevehouse, Jon C., *International Relations: Seventh Edition*, London, Longman Publishing, 2006, p.71.
[126] Hayes, Adam. Game Theory. *Investopedia*. 2021.
[127] Chen James. Nash Equilibrium. *Investopedia*. 2021.

1. Game: The circumstance of an aggressor-NWS conducting transnational NBST to a rival NWS under the presumed "trigger" of the rival NWS demonstrating an increase regarding its total nuclear weapons inventory;

2. Players: The players are represented by the aggressor-NWS and the victim-NWS;

3. Strategy: The quantity of aggressive and non-aggressive consequential responses issued by the aggressor-NWS and the victim-NWS;

4. Payoff: The payoff that the aggressor-NWS and the victim-NWS receive from either aggressive or non-aggressive consequential responses;

5. Information Set: The acknowledged crimes and their (lack of) sanctions in the aftermath regarding the NWS' payoffs as the subsequent component of the game;

6. Equilibrium: Depending on the combination of the players' responses, multiple equilibriums are identified (Genocide, Crime of Aggression, and Peaceful Settlement) as well as a Nash Equilibrium (Nuclear War);

The game theory model in Figure 14 depicts the "transnational NBST" scenario related to potential nuclear war escalation between the supplying-NWS and the victim-NWS. It considers an aggressor-NWS conducting transnational NBST toward a rival NWS under the presumed "trigger" of the rival NWS increasing its total nuclear weapons inventory. Once the nuclear attack has been conducted, the victim-NWS has three responses to choose from: conducting a counter-NBST attack [A], issuing a NBST threat [B], or seeking a peaceful solution [C]. The aggressor-NWS, on the other hand, also has three consequential responses to choose from: conducting a repeating NBST attack [M], issuing a counter-NBST threat [N], or seeking a peaceful solution [O].

Figure 14: Transnational NBST-to-Nuclear War Escalation (NWS x NWS)

Aggressor NWS \ Victim NWS	Response 1: [A]	Response 2: [B]	No Response: [C]
Response 1: [M]	Nuclear War 2,2	Genocide 1,2	Unwarranted Genocide 0,2
Response 2: [N]	"Justified" NBST (Genocide) 2,1	Crime of Aggression 1,1	Unwarranted Crime of Aggression 0,1
No Response: [O]	"Justified" NBST (Genocide) 2,0	Crime of Aggression 1,0	Peaceful Settlement 0,0

[A/M] = 2; [B/N] = 1; [C/O] = 0;

2 = genocide; 1 = crime of aggression; 0 = not genocide nor a crime of aggression;

Nash Equilibrium (NE) underlined

We notice that crimes of genocide manifested by transnational NBST are committed within the following combinations: (A,M), (B,M), (C,M), (A,N), and (A,O), while crimes of aggression manifested by NBST threats are committed within the following combinations: (B,N), (C,N) and (B,O). Responses including both genocide and crimes of aggression are, all in all, regarded as acts of genocide. The Nash Equilibrium is identified within the (A,M) combination, where continuous transnational NBST demonstrations lead to nuclear war.

- **"Domestic NBST" Game Theory Model (NWS x NWS)**

1. Game: The circumstance of a supplying-NWS conducting domestic NBST to a rival NWS under the presumed "trigger" of the rival NWS demonstrating an increase regarding its economic strength;

2. Players: The players are represented by the supplying-NWS and the victim-NWS;

3. Strategy: The quantity of aggressive and non-aggressive consequential responses issued by the supplying-NWS and the victim-NWS;

4. Payoff: The payoff that the supplying-NWS and the victim-NWS receive from either the aggressive and non-aggressive consequential responses;

5. Information Set: The acknowledged crimes and their (lack of) sanctions in the aftermath regarding the NWS' payoffs as the subsequent component of the game.

6. Equilibrium: Depending on the combination of the players' responses, multiple equilibriums are identified (Genocide, Politicide, Crime of Aggression, and Peaceful Settlement) as well as a Nash Equilibrium (Nuclear War);

The game theory model in Figure 15 depicts the "domestic NBST" scenario related to potential nuclear conflict escalations between the supplying-NWS and the victim-NWS. It considers a NWS supplying radioactive or nuclear resources to a rival NWS' domestic terrorist group under the presumed "trigger" of the rival NWS manifesting an economic strength increase. Once the supplied resources have been traced back to their country of origin, the victim NWS has to choose from the following responses: conducting transnational NBST [A], issuing a NBST threat [B], conducting a counter-domestic NBST attack [C], or seeking a peaceful solution [D]. The supplying NWS, on the other hand, has three consequential responses to choose from: conducting a counter-NBST attack [Q], issuing a counter-NBST threat [R], or seeking a peaceful solution [S].

Figure 15: Domestic NBST Nuclear War Escalation (NWS x NWS)

		Victim NWS			
		Response 1: [A]	Response 2: [B]	Response 3: [C]	No Response: [D]
Supplying NWS	Response 1: [Q]	Nuclear War <u>3,3</u>	"Justified" and Conducted NBST 1,3	"Justified" and Conducted NBST 2,3	Unwarranted Transnational NBST 0,3
	Response 2: [R]	"Justified" NBST Threat 3,1	"Justified" NBST Threat 1,1	"Justified" NBST Threat 2,1	Unwarranted NBST Threat 0,1
	No Response: [S]	Unjustified Genocide 3,0	Unjustified Crime of Aggression 1,0	Unjustified Politicide 2,0	Peaceful Settlement 0,0

[A/Q] = 3; [C] = 2; [B/R] = 1; [D/S] = 0;

3 = genocide; 2 = politicide; 1 = crime of aggression; 0 = peaceful solution;

Nash Equilibrium (NE) underlined

We notice that crimes of genocide manifested by transnational NBST are committed regarding the following combinations: (A,Q), (B,Q), (C,Q), (D,Q) and (A,S), while crimes of aggression are manifested by NBST threats regarding the following combinations: (A,R), (B,R), (C,R), (D,R) and (B,S). Responses including both genocide and crimes of aggression are, all in all, considered as acts of genocide. We also identify crimes of politicide regarding the following combinations: (C,Q), (C,R) and (C,S). The Nash Equilibrium is identified within the (A,Q) combination, where continuous transnational NBST demonstrations lead to nuclear war.

The Genocide Convention not including crimes of polticide regarding this scenario represents a major legal loophole. Triggering acts of domestic NBST should not be ignored, given their potential to cause a nuclear war as the worst possible outcome. Hence, the concept of politicide, at least according to professor Luis Kutner, can be observed from another perspective – a crime against world peace which consists of planning, preparation, initiation or waging of a war of aggression; or a war in violation of international treaties, agreements or

assurances; or participation in a common plan or conspiracy for the accomplishment of any of the aforementioned.[128] While a rather broad scope of illegitimate military-related acts is incorporated, political elements are not explicitly included. In relation to nuclear weapons, Kutner's definition resembles nuclear blackmail, by contrast to long-term consequences of NBST threats issued to rival NWS or NNWS with nuclear aspirations. This makes sense given that NBST is conducted during peacetime, yet also manifests strong conflict escalation potentials;

Secondly, ***nuclear blackmail*** is characterized as a nuclear strategy involving nuclear terrorism threats addressed to NNWS or NWS with the purpose of the threatening NWS to force their opponents, primarily during wartimes, to perform activities in their favor based on psychological fear. While nuclear threats were vague, they were seldom transparently meaningless and easy to dismiss.[129] For instance, in 1953, the popular military hero of World War II, General Dwight Eisenhower, was chosen by the Republican Party to oppose President Truman's Democratic successor. Eisenhower's promise during the campaign to use his influence to end the Korean War greatly influenced the American public. Privately, President Eisenhower threatened to use nuclear weapons to settle the dispute, where the threat worked.[130] Moreover, nuclear absolutists suggest that the mere possession of a nuclear arsenal – of any size – allows states to blackmail and intimidate other states, regardless of others' military capabilities.[131] During peacetime, the effectiveness of NBST threats would vary depending on whether the NWS is threatening a rival NWS or a NNWS, given that having a nuclear arsenal represents a major advantage for a State's military forces and national security.

[128] Kutner, Luis. Politicide: The Necessity of an International Court of Criminal Justice. *Denver Journal of International Law & Policy*. Vol.2, no.1, 1972: 55.
[129] Betts, Richard K, *Nuclear Blackmail and Nuclear Balance*. Washington, Brookings Institution Press, 2010, p.9.
[130] Leibo, Steven, A, *East and Southeast Asia 2018-2019*. Lanham, Rowman and Littlefield, 2018, p.129.
[131] Sechser, Todd, S, and Fuhrmann, Mathhew, *Nuclear Weapons and Coercive Diplomacy*. Cambridge University Press, 2017, p.9.

Table 27: Nuclear Blackmail vs. Nuclear-Based State Terrorism (NBST) Threat

Components	Nuclear Blackmail	Nuclear-Based State Terrorism Threat
Malefactors	State Actors (NWS)	- State Actors (NWS) - Nth Countries
Targets	- NNWS - Rival NWS	Political Opponents: - States with conflicting political ideology - Groups belonging to a political movement - Individuals directly engaged in domestic or foreign political matters - Objects manifesting conflicting political values
Objectives	- Psychological Fear - Forcing the adversary to operate in the coercer's favor - Military Strategy - Nuclear Strategy	- Psychological Fear - Crowd Manipulation - National Power - Political Strategy - Nuclear Strategy
Methods	Threat of (Tactical) Nuclear Weapon Utilization	Threat of Nuclear Weapons Utilization (Tactical and Strategic)

While objectives of NBST threats, according to Table 27, are not necessarily considered as criminal offenses, NBST threats themselves underlie serious criminal aspects. International law makes crystal clear that states and individuals are accountable for their actions. In addition, states may establish international institutions and governance structures designed to hold accountable in fact those who violate the law. Yet a massive institutional shortfall and information deficit exists in the accountability of states and individuals when it comes to nuclear threats and strikes. Although offences against international law have been proscribed at a certain level of generality, nobody to date has dug deeply into the doctrinal, scientific and ecological weeds of what a nuclear strike in particular would actually look like regarding the vast humanitarian and environmental damage as it relates to law-of-war violations the strike

might generate.[132] At this instant, it may be that crimes of aggression represent expeditious transgression of international law concerning the utilization of nuclear weapons. In this regard, we consider the ICC prohibition on the planning and preparation of a nuclear strike as well as the U.N. Charter's – incorporated by reference into the ICC statute – prohibition on the "*the threat or use of force against the territorial integrity or political independence of any state*".[133] The Crime of Aggression, according to the ICC statute, means:

> "*the planning, preparation, initiation or execution by a person in the position effectively to exercise control over or to direct the political or military action of a State, of an act of aggression which, by its character, gravity and scale, constitutes a manifest violation of the Charter of the United Nations*".[134]

An act of aggression, in turn, is defined by the ICC statute as "*the use of armed force by a State against the sovereignty, territorial integrity or political independence of another State, or in any other manner inconsistent with the Charter of the United Nations*" Among crimes of aggression are "*[b]ombardment . . . against . . . territory" and "use of any weapons . . . against . . . territory*". This definition plainly includes the use of nuclear weapons, especially by a first-strike state, as well as the "*planning [and] preparation*" of that strike and "*the threat of use of force against the territorial integrity or political independence of any state*".[135] The crime of aggression is designed expressly for peacetime, to put additional weight on the general prohibition to wage war in the UN Charter and punish individuals who break it.[136] Rival NWS increasing their nuclear arsenal or NNWS manifesting nuclear aspirations are already perceived as "nuclear threats", yet not all nuclear threats lead to conflict escalations serious enough to result in nuclear war. Coercive NWS must pay attention to the target-state's political influences

---

[132] Colangelo, Anthony J., Hayes, Peter. An International Tribunal for the Use of Nuclear Weapons. *Journal for Peace and Nuclear Disarmament*. Vol.2, no.1, 2019: 219.

[133] Colangelo, Anthony J., Hayes, Peter. An International Tribunal for the Use of Nuclear Weapons. *Journal for Peace and Nuclear Disarmament*. Vol.2, no.1, 2019: 225.

[134] Coalition for the International Criminal Court. The Crime of Aggression. *Coalition for the International Criminal Court*. n.d.

[135] Colangelo, Anthony J., Hayes, Peter. An International Tribunal for the Use of Nuclear Weapons. *Journal for Peace and Nuclear Disarmament*. Vol.2, no.1, 2019: 226.

[136] Burri, Nina, *Bravery or Bravado? The Protection of News Providers in Armed Conflict*, Leiden, Brill Nijhoff, 2015, p.310.

– the NWS's offense by demonstrating NBST threats is political, while the target-state's defense could be either political, concerning a NNWS, or both political and military, concerning a rival NWS. While a NNWS' political defense or response to the issued NBST threat is regarded as weaker due to the lack of nuclear weapons possession, threatened NNWS may also commit an act of aggression. As a result, NBST threats slowly transfer from the nuclear absolutists' view toward the nuclear relativists' view, which are further divided on just how much of an advantage is necessary for nuclear weapons to be useful tools of coercive bargaining. Some argue that nuclear states cannot use their arsenals coercive purposes if their opponents also possess the bomb, while others assert that nuclear coercion can be effective, even against other nuclear powers, considering that nuclear-superior states – those with larger and more sophisticated nuclear arsenals – have an important advantage.[137] When a NBST threat is addressed toward a rival NWS or a NNWS during a nuclear arms race, serious conflict escalations between the two states is quite plausible. The process of conflict escalation is complex and unpredictable. New issues and conflict parties can emerge, internal power struggles can alter tactics and goals, and secondary conflicts and spirals can further complicate the situation.[138] The involvement of nuclear weapons undoubtedly contributes toward potentially deadly conflicts within the international community. In response, we display two independent scenarios illustratively depicted by game theory models, which could represent either zero-sum or non-zero-sum games, depending on NWS/NNWS' combination of responses. The (lack of) nuclear weapons possession, as previously mentioned, is believed to accurately describe states' probabilities of "winning" or "losing" when NBST threats are issues by a NWS.

- **"NBST Threat" Game Theory Model (NWS x NNWS);**

1. Game: The circumstance of a NWS issuing a NBST threat to a NNWS under the presumed "trigger" of the NNWS demonstrating nuclear aspirations;

2. Players: The players are represented by the threatening NWS and the threatened NNWS;

[137] Sechser, Todd, S, and Fuhrmann, Mathhew, *Nuclear Weapons and Coercive Diplomacy*. Cambridge University Press, 2017, p.9.
[138] Ramsbotham, Oliver, Woodhouse, Tom and Miall, Hugh, *Contemporary Conflict Resolution: The Prevention, Management and Transformation of Deadly Conflicts*, Cambridge, Polity Press, 2005, p.11.

3. Strategy: The quantity of aggressive and non-aggressive consequential responses issued by the threatening NWS and the threatened NNWS;

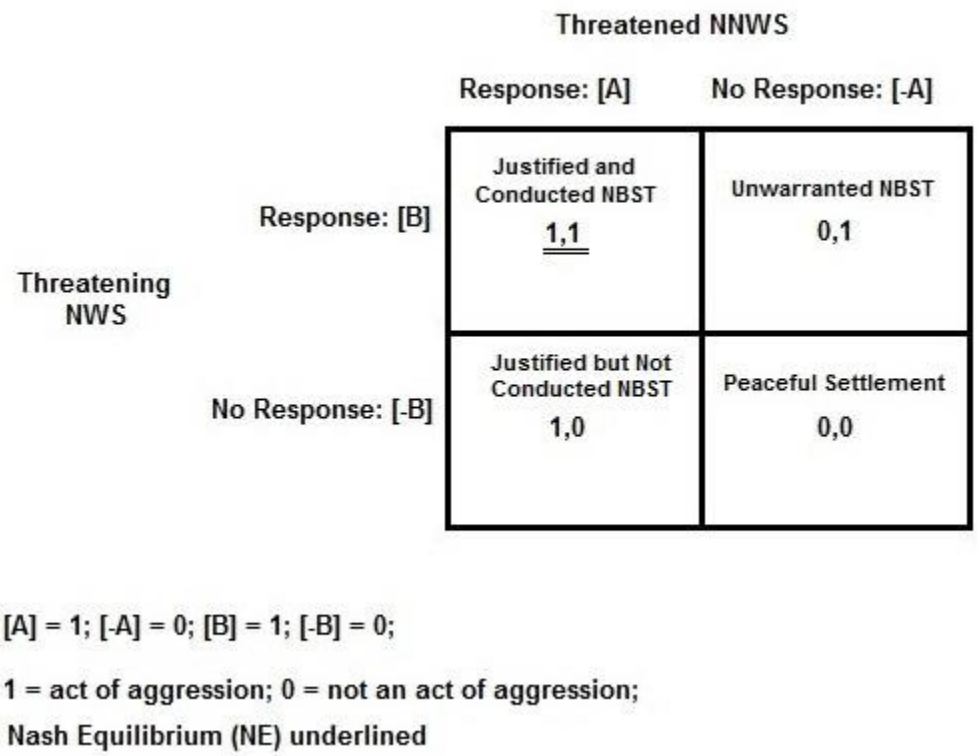
4. Payoff: The payoff that the threatening NWS and the threatened NNWS receive from either the aggressive or non-aggressive consequential responses;

5. Information Set: The acknowledged crimes and their (lack of) sanctions in the aftermath regarding the NWS' payoffs as the subsequent component of the game;

6. Equilibrium: There are three primary equilibriums identified depending on the combination of the NWS/NNWS' responses (Genocide, Crime of Aggression, and Peaceful Settlement), as well as a Nash Equilibrium (one-sided NBST);

The game theory model in Figure 16 depicts the first conflict escalation scenario related to potential conflict escalation between the threatened NNWS and the threatening NWS. It considers a NWS issuing a NBST threat to a NNWS under the presumed "trigger" of the NNWS demonstrating nuclear aspirations. Once the NBST threat has been issued, each state has the option either to respond or not to respond to the NWS' threat. In this game theory model, the threatened NNWS chooses between aggressively responding (A) or not responding to the threatening NWS (-A), indicating that it complies with the demands of the threatening NWS) or seeks a peaceful solution, while the threatening NWS chooses between attacking (B) and not attacking (-B) the threatened NNWS.

Figure 16: NBST Threat Conflict Escalation (NWS x NNWS)



[A] = 1; [-A] = 0; [B] = 1; [-B] = 0;

1 = act of aggression; 0 = not an act of aggression;

Nash Equilibrium (NE) underlined

Besides the issued NBST threat representing a crime of aggression, we also notice crimes of genocide manifested by NBST toward the threatened NNWS committed regarding combinations (A,B) and (-A,B), as well as acts of aggression manifested in the form of violent attacks toward the threatening NWS, whereas the Nash Equilibrium is identified within the (A,B) combination, as the threatened NNWS' aggressive response leads to a NBST attack. Legally speaking, acts of aggression within this game theory model simultaneously include the threatened NNWS' violent attacks toward the threatening NWS.

- **"NBST Threat" Game Theory Model (NWS x NWS);**

1. Game: The circumstance of NWS issuing a NBST threat to a rival NWS under the presumed "trigger" of total nuclear weapons inventory increasing;

2. Players: The players are represented by the threatened NWS and the threatened NWS;

3. Strategy: The (lack of) consequential responses manifested by the threatening NWS and the threatened NWS;

4. Payoff: The payoff that the threatening NWS and the threatened NNWS receive from their consequential (lack of) responses, which are considered “criminal”;

5. Information Set: The acknowledged crimes and their (lack of) sanctions in the aftermath regarding the NWS’ payoffs as the subsequent component of the game;

6. Equilibrium: There are three primary equilibriums identified depending on the combination of the NWS’ responses (Genocide, Crime of Aggression, and Peaceful Settlement), as well as a Nash Equilibrium (two-sided NBST);

The game theory model in Figure 17 depicts the second conflict escalation scenario related to potential conflict escalation between the threatened NWS and the threatening NWS. It considers a NWS issuing a NBST threat to a rival NWS under the presumed “trigger” of the increasing of nuclear weapons by the rival NWS. Once the NBST threat has been issued, the threatened NWS has three options to choose from: respond by conducting NBST toward the threatening NWS [A] , to respond with issuing a NBST counter-threat toward the threatening NWS [B], or to not respond aggressively by seeking a peaceful solution [C]. The threatening NWS, on the other hand, chooses between conducting NBST toward the threatened NWS [M] and seeking a peaceful solution [N].

Figure 17: NBST Threat Conflict Escalation (NWS x NWS)

Threatening NWS	Threatened NWS: Response 1: [A]	Threatened NWS: Response 2: [B]	Threatened NWS: No Response: [C]
Response: [M]	Justified and Conducted NBST **2,2**	Not Justified but Conducted NBST **1,2**	Unwarranted NBST **0,2**
No Response: [N]	Justified Seek for Peaceful Solution **2,0**	Justified Seek for Peaceful Solution **1,0**	Peaceful Settlement **0,0**

[A/M] = 2; [B] = 1; [C/N] = 0;

2 = act of aggression; 1 = crime of aggression; 0 = no act nor crime of aggression;

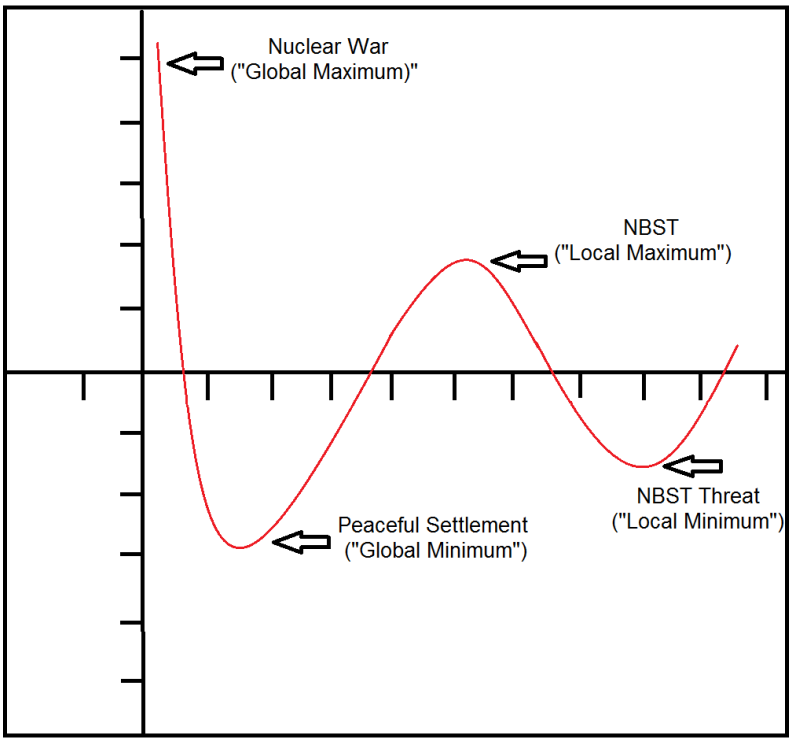
Nash Equilibrium (NE) underlined

Besides issued NBST threats representing crimes of aggression, we also notice crimes of genocide manifested by NBST conducted by both NWS regarding combinations (A,M), (B,M), (C,M) and (A,N), whereas the Nash Equilibrium is identified within the (A,M) combination, as the threatened NWS' conducted NBST leads to a counter-NBST attack;

Taking into consideration all four game theory models, it is important to regard the majority of combinations displayed in order to apply appropriate punishments for the explicitly defined crimes, as they could lead to a potential nuclear war – a situation where conflicts between states completely spiral out of control. Furthermore, it is evident that many of the dynamics between nuclear-armed states in the second nuclear age are embedded in regional and even local conflicts, which are over a wide variety of complex issues connected to the international system in different ways. Changes in the nuclear capabilities or posture of one country can have cascading effects across a range of countries in different regions as a result of interconnected

and overlapping strategic relationships.[139] Moreover, depending on the gravity of responses chosen by the NWS and/or NNWS concerned as presented in the game theory models, a specific *NBST Conflict Escalation Curve* is presented, which is related to how far dehumanization has proceeded, that is, conflicts escalate in the degree to which parties dehumanize one another or one party is dehumanizing the other,[140] proposing the intensity of a NBST-related conflict.

Figure 18: Nuclear-Based State Terrorism Conflict Escalation Curve



We notice that the NBST Conflict Escalation Curve strongly resembles displayed functions on a polynomial graph, demonstrating a dynamic, rather than a static wave structure, nor are there any stages connected by the NBST conflict escalation curve. Instead, we demonstrate an adaptation of the four types of minimum and maximum values on polynomial graphs of a given function (collectively called extrema), where a general definition of a *global* minimum or

[139] Meyerle, Jerry, Gause, Ken and Ostovar, Afshon, *Nuclear Weapons and Coercive Escalation in Regional Conflicts: Lessons from North Korea and Pakistan*, Arlington County, CNA, 2014, p.9.

[140] Alexis, Flynn. What is the theory of escalation? *Greenhead*. 2019.

maximum is "the overall greatest or least outputs of a function," and a *local* minimum or maximum is "the greatest or least output value in a particular limited domain."[141] The term "output" within our context is understood as the aftermath regarding the parties' responses, being parallel to a "function". Moreover, their classification as "global" or "local" depends on whether the selected responses gravitate toward a nuclear war or a peaceful settlement. Accordingly, a nuclear war depicts the global maximum, while a peaceful settlement depicts the global minimum. On the other hand, NBST depicts the local maximum, while NBST threats depict the local minimum. The NBST conflict escalation curve's dynamic wave structure is, hence, characterized as flexible since Figure 18 only displays the position of the overall aftermaths;

[141] CK-12. Characteristics of Polynomial Graphs. *CK-12*. 2019.

Chapter III: Nuclear-Based State Terrorism: A Method for Obtaining National and Military Power

III.I. The Constructive Correlation between Nuclear-Based State Terrorism and National and Military Power

The most convenient and common way of classifying States is in terms of national power. The aspiration of power being the distinguishing element of international politics, as of all politics, international politics is of necessity power politics.[142] This is not surprising considering that most definitions of politics involve power. Most international interactions are political or have ramifications of politics.[143] And while nuclear weapons do play a major role in international politics, their influence significantly spreads on to national power demonstrated in international relations, where it is necessary to contemplate how dominant NWS utilize radioactive and nuclear resources in order to strengthen their objectives much the dismay of rival NWS and NNWS manifesting nuclear aspirations. Yet rising powers should not be entirely excluded from this principle. In relation to this argument, a more comprehensive definition applicable to international relations is given by Rosen and Jones who define power as "*the ability of an international actor to use its tangible and intangible resources and assets in such a way as to influence the outcomes of events in the international system in the direction of improving its own satisfaction within the system*."[144]

Concerning the circumstances related to the currently ongoing nuclear arms race, NWS may resort to specific geopolitical strategies including radioactive or nuclear resources in an attempt to undermine the rival NWS' psychological dimension of their national power. One of such geopolitical strategies includes *domestic NBST* – NWS supplying radioactive or nuclear resources to rival NWS' domestic terrorists groups. It is also plausible for NNWS, representing either allies of current NWS or displaying significant nuclear aspirations, to be subjected to domestic NBST demonstrations. The particular variable of psychological power must be

[142] Ahmed, Khalid and Fatmi, Tariq, "The Role of Power in International Politics". *Pakistan Horizon*. Vol.24, no.4, 1971:3.
[143] Baldwin, David A. Power and International Relations. In *Handbook of International Relations*, Walter Carlsnaes, Thomas Risse and Beth A. Simmons (eds.), 273-297. London: SAGE Publications Ltd, 2013: 273.
[144] Ahmad, Azhar, "Concept of National Power" *Strategic Studies*. Vol.32, no.2/2, 2011:83.

emphasized given that, besides the understandable psychological terror, there is a variety of political consequences arising from incidents of nuclear terrorism that affect governments of many states in addition to the government of the state victimized by nuclear terrorist acts.[145] The measurement of the psychological dimension of national power is a critical issue, where the purpose of power formulas is to enable a shift from theoretical speculations to empirical confirmations. If national power were defined in operational terms, it could be measured by empirical means (prevailing in war, crisis, international decision making). One could analyze the composition of power, that is, the weighting of factors and their specific relationship to one another.[146] Furthermore, one of the underlying motives for measuring and assessing the international system in terms of power relations is the hope that the spread of objectified methods of measurement will contribute to more peaceful resolutions of many international conflicts.[147] Hart identifies three main approaches to the measurement of power in international relations: (1) *control over resources*, (2) *control over actors*, and (3) *control over events and outcomes*.[148] We, nevertheless emphasize the third approach due to its advantages regarding cumulative undertakings and interrelationship where domestic NBST demonstrations allow for an aggressor-NWS to control events and outcomes on the territory of the victim-NWS, however, the national power-related dubiety remains. Moreover, as content within the national power dynamics, it is evident that military power is an important factor in international relations and also has a bearing on international disputes. By the same token, the emergence of nuclear weapons with their unprecedented destructive potentiality has brought about a significant change in the traditional view of military power.[149] The advent of nuclear weapons is postulated to only intensify an aversion to the use of violence in international affairs, which has, with certain rather obvious exceptions, increasingly characterized the conduct of foreign

[145] Forrest, Frank R. Nuclear Terrorism and the Escalation of International Conflict. *Naval War College Review*. Vol.29, no.2, 1976, p.18.
[146] Höhn, Karl Hermann, *Geopolitics and the Measurement of National Power*. PhD Dissertation, University of Hamburg, 2011, p.6.
[147] Sułek, Mirosław. Measurement of national power – a powermetric model. *Przegląd Geopolityczny*. Vol.32, 2020: 37.
[148] Chang, Chin-Lung, *A Measure of National Power*, Taiwan, Fo-guang University, 2004, p.4.
[149] Maqsood, S.A. National Strength and the Use of Military Power. *Pakistan Horizon*. Vol.22, no.2, 1969, p.120.

policy by the major powers since the latter part of the nineteenth century.[150] Nuclear arms races may represent an exception, considering that nuclear weapons correlate to dominance in international relations. Military power is ultimately the power to destroy and kill, or to occupy and control, and hence to coerce. In the international system, military power – like other forms of influence – is a relation among states that permits one government to induce another to behave in a way which the latter would not have chosen freely. Military power thus permits a degree of control over the environment.[151] Strictly speaking, national military power exists only in relation to particular other nations and regarding particular conflict situations. This is *actual* military power. However, nations may also have *latent* or *potential* military power in the sense that political leaders and military staffs speculate about hypothetical power relationships – that is to say, they are aware of likely power relationships that would obtain if particular countries were pitted against each other under particular circumstances.[152] While latent military power is yet supposed and not necessarily realistic, *transnational NBST demonstrations* would permit nations to manifest their actual military power in such conflict situations within a highly competitive nature of a nuclear arms race, where nuclear weapons are perceived as the common resource for which they are competing. Moreover, the rivalry of nations within a nuclear arms race would not stop at the quantity of their total nuclear weapons inventory, but simultaneously transfer to their "quality" as well. In contrast to most prior work on military innovation, which has tended to focus on who innovates and why, it is the diffusion of a military innovation throughout the international system that most determines its influence on international politics.

III.II. A Mathematical Model for Measuring National Power

Given that domestic NBST represents a specific geopolitical strategy utilized by an aggressor-NWS involving radioactive or nuclear resources being supplied to a rival NWS' domestic

[150] Luard, Evan, *Basic Texts in International Relations: The Evolution of Ideas about International Society*, London, Palgrave *Macmillan, 1992, p.355.*

[151] Knorr, Klaus. The International Purposes of Military Power. In *Theories of Peace and Security*, John Garnett (ed.), 50-63. London: Palgrave Macmillan, 1970, p.50.

[152] Knorr, Klaus. The International Purposes of Military Power. In *Theories of Peace and Security*, John Garnett (ed.), 50-63. London: Palgrave Macmillan, 1970, p.51.

terrorist group for the purpose of undermining the rival NWS' psychological dimension of their national power, the analogous question here is as follows: "*How manifesting domestic NBST does influence the supplying-NWS' psychological dimension of its national power?*"

The answer to this question can be regarded as twofold, given that domestic NBST represents a double-edged sword that could either increase or decrease the supplying-NWS' psychological power. We postulate that such inconsistency would depend on one single determining factor: the probability of the source of the supplied radioactive or nuclear resources being traced back to the country of origin. Matthew Bunn, a nuclear and energy policy analyst at the Harvard Kennedy School at Harvard University, argues that a strong case can be made that under all but a few circumstances, states are extremely unlikely to transfer a nuclear weapon or weapons-usable nuclear materials to a terrorist group deliberately. Such a decision would mean transferring the most awesome military power the state possesses to a group over which it has little control. If the terrorists actually used the transferred capability against the United States or one of its allies, there would be a substantial chance that the source of the weapon or material would be traced back to the country of origin. The resulting retaliation would be overwhelming, almost certainly removing the government that decided on such a transfer.[153] The gravity of Bunn's argument may be further emphasized under the consideration that any type of terrorism is, foremost, a political and psychological weapon, including NBST. While it would presumably be easier for both parties concerned (the rival NWS' domestic terrorist group and the supplying-NWS) to settle for RDDs or radioactive materials, such might also be traced back to their country of origin. We set our hypothesis by addressing two separate aftermath scenarios, where the relationship between the supplying-NWS and the victim-NWS regarding their psychological power is negative – as the victim-NWS' psychological power decreases, the supplying-NWS' psychological power increases and vice versa. In correspondence, two individual mathematical models which represent an adaptation of the classic two-dimensional Lotka-Volterra system, originally developed to describe the population

[153] Bunn, Matthew, "A Mathematical Model of the Risk of Nuclear Terrorism", *The Annals of the American Academy of Political and Social Science*. Vol. 607, 2006: 115.

dynamics of two interacting species, a predator and its prey,[154] are displayed in order to demonstrate such a negative relationship. Regarding the aftermath of NWS-supplied radioactive or nuclear weapons resources not being traced back to their country of origin, we develop the (-/+) relationship displayed within the following mathematical model:

$$\frac{dD}{dt} = \lambda D - \mu C D \tag{13}$$

$$\frac{dC}{dt} = \omega D C + \psi C \tag{14}$$

, where:

- ***dD/dt*** and ***dC/dt*** represent the rates of change concerning the psychological dimension of both the victim-NWS' and the aggressor-NWS' national power, respectively;
- "***D***" represents the victim-NWS;
- "***C***" represents the aggressor-NWS;
- Solutions ***D(t)*** and ***C(t)*** represent the psychological dimension for the aggressor-NWS and the victim-NWS at time t;
- "λD" represents the victim-NWS' national power;
- "ψC" represents the aggressor-NWS' national power;
- "μCD" represents the rate at which the victim-NWS is attacked with the supplied resources by its domestic terrorist group;
- "ωDC" represents the rate at which the aggressor-NWS supplied radioactive or nuclear resources to the victim-NWS' domestic terrorist groups;

The presented mathematical model displays the dynamics of how the victim-NWS' psychological power decreases, while the supplying-NWS' psychological power increases simultaneously. On one hand, the victim-State suffers the discomposing of its national security and is perceived by the international community as incompetent to defend itself from domestic

[154] Hadžiabdić, Vahidin, Mehuljić, Midhat and Bektešević, Jasmin. Lotka-Volterra Model with Two Predators and Their Prey. *TEM Journal*. Vol. 6, no.1, 2017:132.

and possibly foreign terrorism (decrease of psychological power). On the other hand, the government of the aggressor-NWS acknowledges its capacity to successfully influence, harm and interfere in other states' political systems and internal stability (increase of psychological power); Regarding the outcome of NWS-supplied radioactive or nuclear resources being traced back to their country of origin, we develop the (+/-) relationship displayed within the following mathematical model:

$$\frac{dD}{dt} = \lambda D + \mu C D \tag{15}$$

$$\frac{dC}{dt} = \omega D C - \psi C \tag{16}$$

, where:

- ***dD/dt*** and ***dC/dt*** represent the rates of change concerning the psychological dimension of both the victim-NWS' and the aggressor-NWS' national power, respectively;
- "***D***" represents the victim-NWS;
- "***C***" represents the aggressor-NWS;
- Solutions ***D(t)*** and ***C(t)*** represent the psychological dimension for the aggressor-NWS and the victim-NWS at time t;
- "λD" represents the victim-NWS' national power;
- "ψC" represents the aggressor-NWS' national power;
- "μCD" represents the rate at which the victim-NWS is attacked with the supplied resources by its domestic terrorist group;
- "ωDC" represents the rate at which the aggressor-NWS supplied radioactive or nuclear resources to the victim-NWS' domestic terrorist groups;

The presented mathematical model displays the dynamics of how the victim-NWS' psychological power increases, while the supplying-NWS' psychological power decreases simultaneously. On one hand, the victim-State receives support from the international

community (increase of psychological power) against the aggressor-NWS which, on the other hand, is perceived by the international community as a state which misuses its resources and, hence, cannot be trusted since it is portrayed as a global danger (decrease of psychological power);

III.III. A Mathematical Model for Measuring Military Power

Given that transnational NBST represents a hostile geopolitical omission perpetrated by an aggressor-NWS involving the threat or conducted nuclear attack toward a rival NWS manifesting nuclear weapons buildup or a NNWS manifesting nuclear aspirations, the main question here is: "*How manifesting transnational NBST does influence the aggressor-NWS' military power?*"

There are three main determinants of national military power. One is military power *potential* – that is, resources capable of being mobilized for the establishment of military sources. The second determinant is the *value* placed on military power by a nation and, hence, the proportion of potential actually transformed into military strength. The third is the *skill* with which resources are cast into ready military strength and with which the use of the resulting military power is directed politically as well as militarily. As nations vary markedly in all three conditions, so the distribution of military power in the international system is highly uneven.[155] When addressing the currently ongoing nuclear arms race, all three determinants would represent a priority for both current and newly emerging NWS, given that nuclear weapons are the most significant manifestation of national military power. In addition, states have reputations for military power. They enjoy power prestige, or power images which rest on the perceptions and expectations of other governments and which, though related to actual and potential power, are not necessarily faithful reflections of actual power.[156] The mathematical model, hence, represents an adaptation of the Competitive Lotka-Volterra equations, originally

[155] Knorr, Klaus. The International Purposes of Military Power. In *Theories of Peace and Security*, John Garnett (ed.), 50-63. London: Palgrave Macmillan, 1970, p.51.

[156] Knorr, Klaus. The International Purposes of Military Power. In *Theories of Peace and Security*, John Garnett (ed.), 50-63. London: Palgrave Macmillan, 1970, p.51.

developed to study two or more species competing for a common resource.[157] Accordingly, multiple NWS are competing against each other in the currently ongoing nuclear arms race regarding the ever-increasing amount of nuclear warheads, where transnational NBST demonstrated by threats or attacks portrays the NWS in concern's national military power as displayed:

$$\frac{dA}{dt} = r_i A_i \left(1 - \frac{\Sigma_{j=1}^{N} \alpha_{ij} A_j}{N_i}\right) \tag{17}$$

, where:

- ***dA/dt*** represents the rate of change regarding the NWS in concern's military power;
- Solution ***A(t)*** represents the military power for the NWS in concern at time t;
- ***"r"*** represents the growth rate of the total nuclear weapons inventory per warhead;
- ***"A"*** represents the total nuclear weapons inventory;
- ***"α"*** represents the sum of the NWS in concern's remaining social variables of national power (economy, political factors and psychological factors);
- ***"N"*** represents the NWS in concern's nuclear capacity;

The presented mathematical model displays the rate of change regarding the NWS in concern's military power as manifested by transnational NBST demonstrations in comparison to rival NWS. Although there are currently nine NWS in total, the mathematical model considers a generalization to any number of NWS competing against each other in a nuclear arms race. Much to the likeness of the Competitive Lotka-Volterra equations, the particular NWS in concern manifests a "self-interaction" component exhibited by *"α"*, which is the sum of the NWS in concern's remaining social variables of national power (economy, political factors and psychological factors);

[157] Easttom, Chuck. Mathematically Modeling Victim Selection in Cyber Crimes. In *ICCWS 2021 16th International Conference on Cyber Warfare and Security*, Juan Lopez, Kalyan Perumalla and Ambareen Siraj (ed.), 71-79, Sonning Common, Academic Conferences Limited, 2021.

Chapter IV: Government Psychology and Military Psychology of Nuclear-Based State Terrorism

IV.I. The Reflection of National Power upon Government Psychology

In discussing the material of political reasoning, Graham Wallas said: "*We must aim at finding as many relevant and measurable facts about human nature as possible and we must attempt to make them all serviceable in political reasoning.*"[158] Accordingly, scholars have demonstrated how leaders' emotions, causal beliefs, cognition, experience, and background, to name a few attributes, shape the conduct of their foreign policy decision making.[159] Studies on human behavior and psychology also point to the importance of reputation – not just that for resolve, but also for violence, honesty, keeping commitments, and so on – in many aspects of social life.[160] Justifying a firm policy by invoking concerns for the country's reputation may serve as an effective rhetorical tool to garner the public's support.[161] Within the current nuclear arms race, NWS manifesting economic national strengths would resort to domestic NBST by supplying rival NWS' domestic terrorist groups by supplying radioactive or nuclear resources, as observed by our second regression analysis. This further regards the question of the supplying NWS' reputation evolving into one for *resolve* or one for *violence*. Although psychologists recognize that much of human behavior is not always rational, human beings, as social perceivers, often operate on the belief that behavior is quite rational. The motivation to expect behavior to be rational is based on two fundamental needs: first, people have e need to make sense of – *to understand* – their world; second, people have a need to *predict* the likely consequences of their own and others' behavior. A more accurate picture of human beings as political actors is one that acknowledges that people are motivated to act in accordance with their own personality characteristics, values, beliefs and attachments to groups. Such picture is identically

[158] Gosnell, Harold F. Some Practical Applications of Psychology in Government. *American Journal of Sociology*. Vol. 28, no.6, 1923: 735.

[159] Yarhi-Milo, Keren, *Who Fights for Reputation: The Psychology of Leaders in International Conflict*, Princeton University Press, 2018, p.7.

[160] Yarhi-Milo, Keren, *Who Fights for Reputation: The Psychology of Leaders in International Conflict*, Princeton University Press, 2018, p.8.

[161] Weisiger, Alex and Yarhi-Milo, Keren. Revisiting Reputation: How Past Actions Matter in International Politics. *International Organization*. Vol.69, no.2, 2015: 473.

visualized by the so-called "Political Being", which manifests personality, values, identity, attitudes, emotions and cognitive processes, all represented in their political universe.[162] Governments, of course, do not rely exclusively on ordinary, inexperienced decision-makers; they rely, to a great extent, on experts. Consequently, determining the relative strengths and weaknesses of lay and expert decision-making is fundamental to designing processes that minimize the damage cognitive limitations will wreak on a society's ability to govern itself wisely. Experts clearly have advantages over laypersons in decision-making. By virtue of their training and experience, they obviously have more knowledge. By itself, however, knowledge is not enough; in fact, extra information feeds certain prevalent cognitive illusions.[163] When addressing domestic NBST as a particular method utilized in an attempt to obtain national power, or at least its psychological dimension, NWS might be faced with advanced nuclear-related difficulties, leaving decision-makers and leaders baffled due to the irreversible damages caused by radioactive or nuclear means. The act of supplying radioactive or nuclear resources to domestic terrorist groups by a certain NWS gravitates, by itself, toward reputation for violence, while the victim-NWS' response further shapes the course of international relations between concerned NWS, under the condition of the supplied radioactive or nuclear resources being traced back to their country of origin.

IV.II. Understanding the Behavioral Background of Nuclear-Based State Terrorism regarding Government Psychology

While already acknowledging domestic NBST demonstrations as methods for causing dynamical changes in relation to the psychological dimension of national power, it has also been postulated that such correlations are twofold by bringing about both national and global consequences. Under the presumption of utilizing radioactive resources, it is unlikely that an RDD detonation would expose a significant number of persons to critical radiation doses, whereas the physical injuries sustained in a detonation may be limited to the blast effect of the

[162] Cottam, Martha, Dietz-Uhler, Beth, Mastors, Elena, and Preston, Thomas, *Introduction to Political Psychology, Mahwah*, Lawrence Erlbaum Associates, 2004, p.1,7.
[163] Rachlinski, Jeffrey J., and Farina, Cynthia R. Cognitive Psychology and Optimal Government Design. *Cornell Law Review*. Vol.87, no.2, 2002: 558.

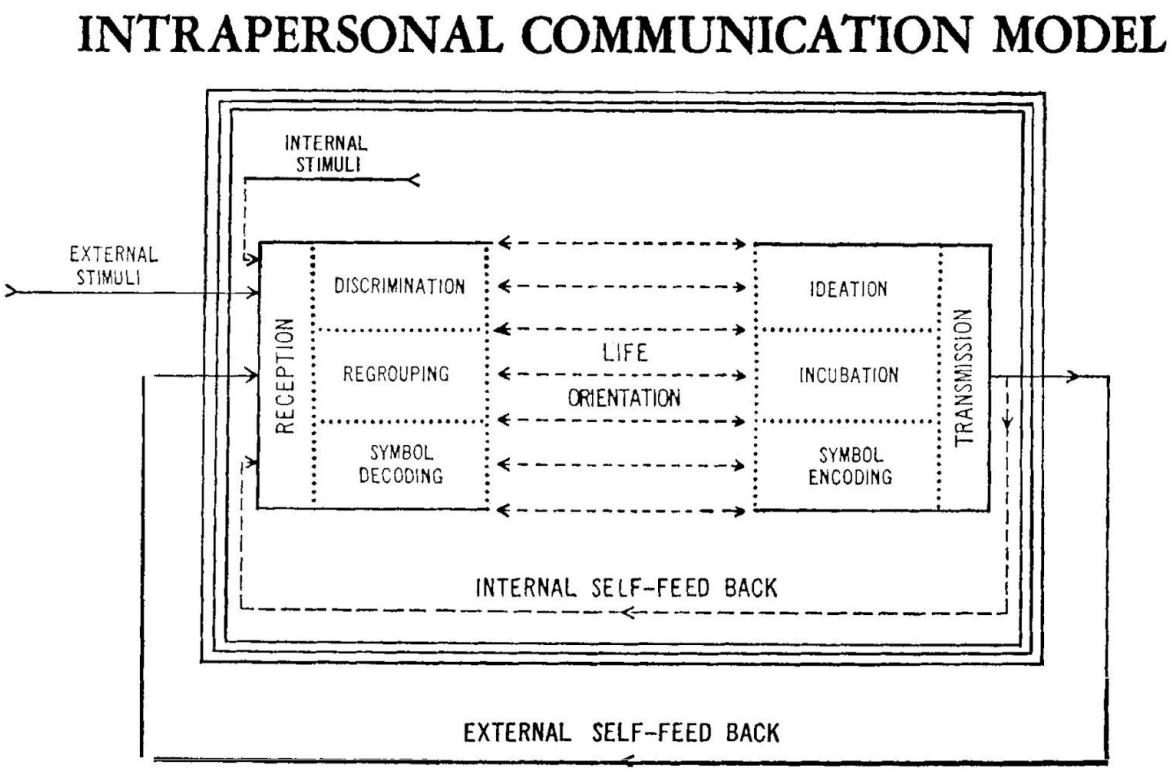
explosion. However, misinterpretation of the explosion as a nuclear detonation may induce fear similar to that produced from a true nuclear detonation.[164] Unlike in Japan in 1945, people now know about the existence of radiation. Another reaction which was prominent in Japan and which could persist for a long time afterwards is for people to be utterly dazed psychologically destroyed, incapable of ensuring their own continued survival without assistance.[165] On the other hand, there is a variety of political consequences arising from incidents of nuclear terrorism that affect governments of many states in addition to the government of the state victimized by nuclear terrorist acts. While the latter is necessarily faced with the most difficult choices in responding to and coping with the effects of nuclear terrorism, a number of factors very quickly brings other governments into contact with the political fallout of a nuclear terrorist act.[166] The same can be claimed for domestic NBST incidents involving radioactive means and resources, where governments of states respond in a political manner to the incident as well. We primarily emphasize the supplying-NWS' reputations for violence or for resolve by displaying an adapted interpretation of an intrapersonal communication model.

[164] Haines, John R. "Dirty Bombs:" Reasons to Worry. *Foreign Policy Research Institute*. 2014.

[165] Dyer, Jim. The Psychopathology of Nuclear War. *Bulletin of the Royal College of Psychiatrists*. Vol.10, 1986, p.2.

[166] Forrest, Frank R. Nuclear Terrorism and the Escalation of International Conflict. *Naval War College Review*. Vol.29, no.2, 1976, 17.

Figure 19: Intrapersonal Communication Model



Note. Adapted from "Intrapersonal Communicology," by R. Rebane, 2013 (http://jeesusjalutasallveelaeval.blogspot.com/2013/12/intrapersonal-communicology.html) In the public domain.

To begin with, a reputation for resolve forms if two conditions are met. First, an observer must explain the target's behavior as a function of its character (or disposition); second, the observer must use this explanation to predict or explain the target's future behavior.[167] Otherwise, a reputation for violence forms. Either way, NWS' "political beings" dictate their reputation course, where NWS' leaders and decision-makers cannot be equally perceived psychologically. What we can do, however, is interpret some essential components of the intrapersonal communication model reflected upon NWS' governments during nuclear arms races:

[167] Mercer, Jonathan, *Reputation and International Politics*, Ithaca, Cornell University Press, 2018, p.45.

- "***External Stimuli***" – the victim-NWS' strong national (economic) strength acknowledged within the international political environment;
- "***Internal Stimuli***" – the supplying-NWS' reaction to its rival's national (economic) strengths ("fear factor");
- "***Life Orientation***" – the supplying-NWS' political being, representing the sum of personality, values, identity, attitudes, emotions and cognitive processes;
- "***Reception***" – the mental processing of external and internal stimuli through the political being;
- "***Transmission***" – the practical processing of the most important stimuli through received by the political being;
- "***Internal Self-Feed Back***" – contemplating the decision to undermine the rival-NWS' psychological dimension of its national power;
- "***External Self-Feed Back***" – conducting domestic NBST by supplying rival-NWS' domestic terrorist groups with radioactive or nuclear resources;

The supplying-NWS' political being represents the central component of the intrapersonal communication model, which is influenced by both external and internal stimuli and acts as a channel between the reception and the transmission. The "*discrimination*", "*regrouping*" and "*symbol decoding*" components are consisted within the reception, which function in a causal manner: (1) the "*discrimination*" component selects only the most important stimuli necessary for NBST decision-making; (2) the "*regrouping*" component arranges the selected NBST stimuli; and (3) the "*symbol decoding*" component converts the previously selected and arranged stimuli into intelligible thoughts; Hence, it could be said that the reception plays a crucial role in the political being's domestic NBST decision-making. Consequently, the "*ideation*", "*incubation*" and "*symbol encoding*" components are consisted within the transmission, which also function in a causal manner: (1) the "*ideation*" component implements the political being's experience and knowledge upon the now intelligible thoughts; (2) the "*incubation*" component further develops the intelligible thoughts; and (3) the "*symbol encoding*" component converts the developed intelligible thoughts into verbal decisions; Hence, it could be said that the transmission plays a crucial role in the political being's domestic NBST demonstration;

International struggles differ primarily from domestic ones in that there are no enforceable rules for guiding the course of conflict into nonviolent channels, and opportunities for mutual accommodation are restricted by the fact that two rival groups may be operating under different rules and with different values. In such an anarchic situation, victory goes to the side that can bring to bear superior means of violence.[168]

IV.III. The Reflection of Military Power upon Military Psychology

In nuclear-tinged crises decision-makers could barely bring themselves to face fully either set of conflicting potential consequences: the loss of political stakes if military stakes were not raised, or the results if threats failed to achieve their political purpose and military escalation occurred.[169] Nuclear weapons demand more drastic and abrupt changes in national behavior as the price of survival than ever before in history. Because of their unprecedented destructive power, they are making obsolete the reliance on force or the threat of it as the ultimate source of security in international relations.[170] Moreover, nuclear weapons greatly enhance the deadly process dehumanizing the enemy because as Patrick Blackett, President of the Royal Society, said: "*Once a nation bases its security on an absolute weapon such as the atom bomb it becomes psychologically necessary to believe in an absolute enemy.*"[171] Yet, national leaders continue to place their faith in weaponry because no alternative means of exercising power is in sight. They continue to create even more elaborate and sophisticated nuclear weapon systems in hopes of acquiring meaningful superiority over its rivals.[172] The triumphs of technology is mastering inanimate nature depend on the fact that the physical world does not fight back. The real problem posed by an enemy's weapons, however, lies not in their physical priorities but in the mental processes of the enemy's weapons experts. The optimism of national leaders seems

---

[168] Frank, Jerome D. The Nuclear Arms Race and the Psychology of Power. In *The Medical Implications of Nuclear War*, Fredric Solomon and Robert Q. Marston (eds.), 474-484. Washington, National Academies Press, 1986, p.477.
[169] Betts, Richard K, *Nuclear Blackmail and Nuclear Balance*. Washington, Brookings Institution Press, 2010, p.9.
[170] Frank, Jerome. Sociopsychological Aspects of the Nuclear Arms Race. In *Psychosocial Aspects of Nuclear Developments: Report of the Task Force on Psychosocial Aspects of Nuclear Developments of the American Psychiatric Association*, Rita R. Rogers, William Beardslee, Doyle I. Carson, Jerome Frank, John Mack, and Michael Mufson (eds.), 1-10. Washington, American Psychiatric Association, 2009, p.1.
[171] Dyer, Jim. The Psychopathology of Nuclear War. *Bulletin of the Royal College of Psychiatrists*. Vol.10, 1986, p.4.
[172] Frank, Jerome D. The Nuclear Arms Race and the Psychology of Power. In *The Medical Implications of Nuclear War*, Fredric Solomon and Robert Q. Marston (eds.), 474-484. Washington, National Academies Press, 1986, p.479.

to prevent them from drawing this obvious conclusion, creating what has been termed the fallacy of the last move.[173]

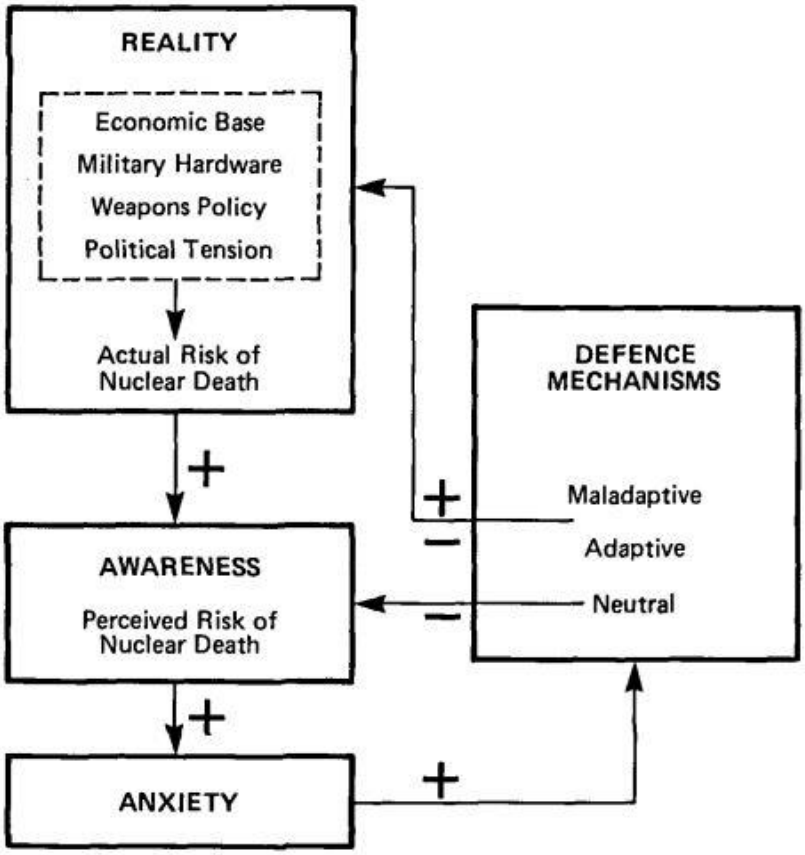
IV.IV. Nuclear-Based State Terrorism as an Area of Study regarding Military Psychology

It can be stated that perceptions concerning aggressive actions of military force such as state terrorism, are only further intensified given the continuous development of nuclear weapons, which is fairly understandable. Nuclear weapons are an almost inconceivably powerful means of destruction; yet analysts and statesmen commonly refer to their "psychological effects", where beliefs create reality on nuclear questions.[174] Many may deem the manifestation of a nuclear war as extremely irrational and even ludicrous, yet underlying fears of peaceful and rational leaders are subconsciously awake by the fact that a nuclear war could be anything but impossible. By already acknowledging transnational NBST demonstrations as methods for obtaining military power during nuclear arms races, our game theory models have observed that transnational NBST attacks and threats can easily go awry – *causing a nuclear war* – particularly when addressed toward rival NWS. There are fundamental ways in which the nuclear arms race is psychological in its roots. This is true above all in the area of strategy. Military strategies and policies are based on what one perceives to be the intentions of an adversary, and upon what each believe will be the impact of a particular policy on the minds of those making decisions on the other side.[175] Observing how such considerations fluctuate during nuclear arms race is crucial, as well as transnational NBST being simultaneously incorporated into operational aspects of military psychology. While the risk of nuclear war during peacetime was previously uncertain, it is believed for transnational NBST to significantly increase the chances of that risk.

---

[173] Frank, Jerome D. The Nuclear Arms Race and the Psychology of Power. In *The Medical Implications of Nuclear War*, Fredric Solomon and Robert Q. Marston (eds.), 474-484. Washington, National Academies Press, 1986, p.480.
[174] Larson, Deborah W. The Psychology of Nuclear Statecraft. *Diplomatic History*. Vol.15, no.3, 1991: 449.
[175] Mack, John E. Psychological effects of the nuclear arms race. *Bulletin of Atomic Scientists*. Vol. 37, no.4, 1981: 18.

Figure 20: Menkes' Nuclear Arms Race Model



Note. Adapted from "Psychological Defense Mechanisms and the Nuclear Arms Race: An Interactive Model" by D.B. Menkes, 1989, *Medicine and War, 5(2)*, p.82.

Menkes' Nuclear Arms Race Model depicts the interrelationship between three main components, those being defense mechanisms, anxiety and the threat of nuclear war. The "threat" is a construct produced by objective elements.[176] What's more, political tension and weapon-use policy represent less-objective parameters by which the "threat" is reconstructed. As observed by our primary regression analysis, objective parameters include NWS' total nuclear weapon inventory, as well as NNWS' nuclear aspirations, which would be expectedly modified by transnational NBST demonstrations being psychological means of creating political tension, as perceived by the rival NWS and NNWS. Nuclear war precipitations, however, do not

[176] Menkes, David, B. Psychological Defense Mechanisms and the Nuclear Arms Race: An Interactive Model. *Medicine and War*. Vol. 5, no.2, 1989: 83.

originate from rival nations being threatened or attacked. We instead identify the aggressor-NWS' cognitively distorted perception of objective parameters as "threats", where transnational NBST demonstrations are falsely comprehended and even equated as "defense mechanisms." In other words, the misperception of threat to leaders' fears, needs, and interests is drawn on the motivated error in international relations.[177] The rationality of actors is not in any way a compulsory presumption of government psychology. What distinguishes human action is not that it is perfectly "rational," for there probably is no such thing, but rather that it is intentional.[178] Political or military personnel consider defense mechanisms as some of the most essential strategy when engaged in nuclear arms races – the nuclear threat itself is given a regulation and feedback by certain actions and comprehensions. Defense mechanisms, moreover, may be labeled *maladaptive* when they increase a real threat (as in this case), *neutral*, or *adaptive* when they decrease it.[179] We can discern transnational NBST demonstrations as maladaptive defense mechanisms by conceivably increasing the threat of nuclear war, where as depicted within Menkes' nuclear arms race model, a long feedback loop illustrates the effect of maladaptive defenses on the objective elements (dotted box) of the situation provoking anxiety.[180] We notice the continuative stimulatory effect (+) addressing the awareness (perceived risk of nuclear death) and the provoked anxiety. The only instance of anxiety not being significantly provoked is if the awareness instead manifests an inhibitory effect (-). The shift toward an inhibitory effects depends on the victim-NWS' response. There are at least four major types of consequences or actions that merit attention. First, we should consider how the government of a victimized state will react to the nuclear terrorist attack. Second, we should examine how other states will perceive the victim's actions and reactions to nuclear terrorism. Third, we must consider the actions of the government of the state ravished by nuclear terrorism toward other states. Finally, we should contemplate the broad systematic

[177] Stein, Janice, G. Building Politics into Psychology: The Misperception of Threat. *Political Psychology*. Vol.9, no.2, 1988: 245.

[178] Blight, James G. How Might Psychology Contribute to Reducing the Risk of Nuclear War? *Political Psychology*. Vol.7, no.4, 1986: 652.

[179] Menkes, David, B. Psychological Defense Mechanisms and the Nuclear Arms Race: An Interactive Model. *Medicine and War*. Vol. 5, no.2, 1989: 83.

[180] Menkes, David, B. Psychological Defense Mechanisms and the Nuclear Arms Race: An Interactive Model. *Medicine and War*. Vol. 5, no.2, 1989: 82.

consequences of nuclear terrorism for international relations generally.[181] The same consequences may be considered regarding NBST threats, where it is the threatened State which shapes the course of dynamics in international relations dependent upon its reactions and perceptions toward the issued NBST threat. Yet, particular emphasis should not only be put upon the threatened State, but upon the entire international community concerned.

Conclusions and Recommendations

With the advance of positive and quantitative science, there is a quest for constructing empirical and systematic structural-functional political theory based on testes hypotheses.[182] Such is the case of Nuclear-Based State Terrorism (NBST), which represents a contemporary concept established by mathematical logistic, primarily through scientific methods of simple linear regression analyses and differential-equation-based mathematical models. Being characterized by the violation of trust, global transnational crimes, and crimes against the environment or quality of life, NBST is simultaneously understood as a method for obtaining national and military power by aggressor-NWS, as supported by their government and military psychology. Keeping in mind that NBST is not exactly broad scholarly-recognized, it is sufficient to say that its dynamic nature allows the possibility of for undergoing continuous activity, development and progress, which makes its adaptation within an already studied geopolitical framework particularly challenging. Society's ultimate necessity of continuously identifying harmful acts of violence conducted by state-actors, particularly through the utilization of nuclear weapons must also be taken into consideration as an equally threatening type of terrorism. Unconventional manifestations of terrorism performed by state-actors formulate the dilemma of its regulation within legal configurations, which further academically elevates the scope of international law.

[181] Forrest, Frank R. Nuclear Terrorism and the Escalation of International Conflict. *Naval War College Review*. Vol.29, no.2, 1976, 12.
[182] Varma, Pradash V. Political Philosophy in the Modern Age. *The Indian Journal of Political Science*. Vol. 30, no.1, 1969:1.

Bibliography

Books

1. Anderton, Charles H., Carter, John R., *Principles of Conflict Economics: A Primer for Social Scientists*, Cambridge University Press, 2009.

2. Asrar, Sarah M, *On the Horizon: A Collection of Papers from the Next Generation*, Lanham, Rowman & Littlefield, 2019.

3. Baldwin, David A. Power and International Relations. In *Handbook of International Relations*, Walter Carlsnaes, Thomas Risse and Beth A. Simmons (eds.), 273-297. London: SAGE Publications Ltd, 2013.

4. Betts, Richard K, *Nuclear Blackmail and Nuclear Balance*. Washington, Brookings Institution Press, 2010.

5. Birkmann, Jörn., *Measuring vulnerability to natural hazards: Towards disaster resilient societies (second edition)*, New York, United Nations University Press, 2013.

6. Blakeley, Ruth. State Terrorism in the Social Sciences: Theories, Methods and Concepts. In *Contemporary State Terrorism: Theory and Practice,* Richard Jackson, Eamon Murphy and Scott Poynting (eds.), 12-27. Abingdon: Routledge, 2009.

7. Burri, Nina, *Bravery or Bravado? The Protection of News Providers in Armed Conflict*, Leiden, Brill Nijhoff, 2015.

8. Chang, Chin-Lung, *A Measure of National Power*, Taiwan, Fo-guang University, 2004.

9. Clemens, Walter C, *Dynamics of International Relations: Conflict and Mutual Gain in an Era of Global Interdependence*, Lanham, Rowman & Littlefield, 2004.

10. Cottam, Martha, Dietz-Uhler, Beth, Mastors, Elena, and Preston, Thomas, *Introduction to Political Psychology, Mahwah*, Lawrence Erlbaum Associates, 2004.

11. Cooper, David, *Arms Control for the Third Nuclear Age: Between Disarmament and Armageddon*, Washington, Georgetown University Press, 2021

12. De Andreis, Marco and Calogero, Francesco, *The Soviet Nuclear Weapon Legacy*, Oxford University Press, 1995.

13. Diab, Robert, *The Harbinger Theory: How the Post-9/11 Emergency Became Permanent and the Case of Reform*, Oxford University Press, 2015.

14. Diehl, Sarah J., and Moltz, James C., *Nuclear Weapons and Nonproliferation: A Reference Handbook*, California, ABC-CLIO, 2008.

15. Doyle II, Thomas E, *Nuclear Ethics in the Twenty-First Century: Survival, Order and Justice*, London, Rowman & Littlefield, 2020.

16. Easttom, Chuck. Mathematically Modeling Victim Selection in Cyber Crimes. In *ICCWS 2021 16th International Conference on Cyber Warfare and Security*, Juan Lopez, Kalyan Perumalla and Ambareen Siraj (ed.), 71-79, Sonning Common, Academic Conferences Limited, 2021.

17. Flynn, James R., *Beyond Patriotism: From Truman to Obama*, Luton, Andrews UK Limited, 2011.

18. Frank, Jerome D. The Nuclear Arms Race and the Psychology of Power. In *The Medical Implications of Nuclear War*, Fredric Solomon and Robert Q. Marston (eds.), 474-484. Washington, National Academies Press, 1986.

19. Frank, Jerome. Sociopsychological Aspects of the Nuclear Arms Race. In *Psychosocial Aspects of Nuclear Developments: Report of the Task Force on Psychosocial Aspects of Nuclear Developments of the American Psychiatric Association*, Rita R. Rogers, William Beardslee, Doyle I. Carson, Jerome Frank, John Mack, and Michael Mufson (eds.), 1-10. Washington, American Psychiatric Association, 2009.

20. Freedman, Lawrence and Michaels, Jeffrey, *The Evolution of Nuclear Strategy: New, Updated and Completely Revised*, London, Springer, 2019.

21. Futter, Andrew, *The Politics of Nuclear Weapons: New, updated and completely revised*, Cham, Springer, 2020.

22. Goldstein, Joshua S, and Pevehouse, Jon C., *International Relations: Seventh Edition*, London, Longman Publishing, 2006.

23. Goldthau, Andreas, *The Handbook of Global Energy Policy*, Malden, John Wiley and Sons, 2016.

24. Haugan, Gregory T, *Sustainable Program Management*, Boca Raton, CRC Press, 2013

25. Immerman, Richard H., and Goedde, Petra, *The Oxford Handbook of the Cold War,* Oxford University Press, 2013.

26. International Law and Policy Institute, *Nuclear Weapons under International Law: An Overview*, Geneva Academy of International Humanitarian Law and Human Rights, 2014.

27. Joint Committee on Atomic Energy, *Hearings and Reports on Atomic Energy, Volume 159*, Washington, U.S. Government Printing Office, 1972.

28. Karp, Regina C., *Security without Nuclear Weapons?: Different Perspectives on Non-nuclear Security*, Oxford University Press, 1992.

29. Knorr, Klaus. The International Purposes of Military Power. In *Theories of Peace and Security*, John Garnett (ed.), 50-63. London: Palgrave Macmillan, 1970.

30. Lee, Steven P, *Morality, Prudence, and Nuclear Weapons*, Cambridge University Press, 1996.

31. Leibo, Steven, A, *East and Southeast Asia 2018-2019*. Lanham, Rowman and Littlefield, 2018.

32. Luard, Evan, *Basic Texts in International Relations: The Evolution of Ideas about International Society*, London, Palgrave *Macmillan, 1992.*

33. Majerus, Joe, *The Decision to employ Nuclear Weapons at Hiroshima and Nagasaki*. Hamburg, Anchor Academic Publishing, 2013.

34. Maslen, Stuart C., *The Treaty on the Prohibition of Nuclear Weapons: A Commentary*, Oxford University Press, 2013.

35. Mercer, Jonathan, *Reputation and International Politics*, Ithaca, Cornell University Press, 2018.

36. Meyerle, Jerry, Gause, Ken and Ostovar, Afshon, *Nuclear Weapons and Coercive Escalation in Regional Conflicts: Lessons from North Korea and Pakistan*, Arlington County, CNA, 2014.

37. Moorthy, P., *Nuclear-Weapon-Free-Zone*, New Delhi, Concept Publishing Company, 2006.

38. Nash, M.L., *Digest of United States Practice in International Law*, Washington, Office of the Legal Adviser, Department of State, 1978.

39. National Academy of Sciences, *The Future of U.S. Nuclear Weapons Policy*. Washington, National Academies Press, 1997.

40. National Research Council, Division on Engineering and Physical Sciences, and the Committee on the Effects of Nuclear Earth-Penetration and Other Weapons, *Effects of Nuclear Earth-Penetrator and Other Weapons*, Washington, The National Academic Press, 2005.

41. Negm, Namira, *Transfer of Nuclear Technology Under International Law: Case Study of Iraq, Iran and Israel*, Leiden, Martinus Nijhoff Publishers, 2009.

42. Nye, Joseph S., and Welch, David A, *Understanding Global Conflict and Cooperation: Intro to Theory and History*, New York, Pearson, 2014.

43. Pelling, Mark, *The Vulnerability of Cities: Natural Disasters and Social Resilience*, Abingdon, Routledge, 2012.

44. Peters, Greg, and Svanström, Magdalena, *Environmental Stability for Engineers and Applied Scientists*, Cambridge University Press, 2019.

45. Ramsbotham, Oliver, Woodhouse, Tom and Miall, Hugh, *Contemporary Conflict Resolution: The Prevention, Management and Transformation of Deadly Conflicts*, Cambridge, Polity Press, 2005.

46. Schabas, William, *Genocide in International Law: The Crime of Crimes*. Cambridge University Press, 2009.

47. Schmid, Alex P, *The Routledge Handbook of Terrorism Research,* New York, Routledge, 2011.

48. Schwartz, Stephen I., *Atomic Audit: The Costs and Consequences of U.S. Nuclear Weapons since 1940*, Washington, Brookings Institution Press, 2011.

49. Sechser, Todd, S, and Fuhrmann, Mathhew, *Nuclear Weapons and Coercive Diplomacy*. Cambridge University Press, 2017.

50. Sharma, Ram N., and Sharma, Rajendra, K., *Anthropology*, New Delhi, Atlantic Publishers and Distributors, 1997.

51. Sloan, Stephen, *Beating International Terrorism – An Action Strategy for Preemption and Punishment*. Alabama, Maxwell Air Force Base, 1986.

52. Smeulers, Alette, Grünfeld, Fred, *International Crimes and Other Gross Human Rights Violations: A Multi-and Interdisciplinary Textbook*, Leiden, Martinus Nijhoff Publishers, 2011.

53. Sultan, Adil, *Universalizing Nuclear Nonproliferation Norms: A Regional Framework for the South Asian Nuclear Weapon States*, Cham, Springer, 2018.

54. Swartz, Marc J., Turner, Victor W., and Tuden, Arthur. *Political Anthropology*, New Brunswick, Transaction Publishers, 2009.

55. United States Arms Control and Disarmament Agency, *Documents on Disarmament*, Washington, United States Arms Control and Disarmament Agency, 1986.

56. United States Congress, *Nuclear Weapons and Foreign Policy: Hearings Before the Subcommittee on U.S. Security Agreements and Commitments Abroad and the Subcommittee*

on Arms Control, International Law and Organization of the Committee on Foreign Relations, United States Senate, Ninety-third Congress, Second Session, on U.S. Nuclear Weapons in Europe and U.S.-U.S.S.R. Strategic Doctrines and Policies, March 7, 14, and April 4, 1974, Washington, U.S. Government Printing Office, 1974.

57. United States Congress, *Preventing Chaos in the Former Soviet Union: The Debate on Providing Aid: Report of the Committee on Armed Services, House of Representatives, One Hundred Second Congress, Second Session, Volume 4,* Washington, U.S. Government Printing Office, 1992.

58. United States Congress, *Nuclear Weapons Complex Modernization: Hearing Before the Strategic Forces Subcommittee of the Committee on Armed Services, House of Representatives, One Hundred Tenth Congress, Second Session, Hearing Held July 17, 2008,* Washington, U.S. Government Printing Office, 2009.

59. United States Congress, *Nuclear Posture Review: Hearing Before the Committee on Armed Services, United States Senate, One Hundred Eleventh Congress, Second Session, April 22, 2010,* Washington, U.S. Government Printing Office, 2011.

60. United States Congress, *Nuclear Weapons Modernization in Russia and China: Understanding Impacts to the United States: Hearing Before the Subcommittee on Strategic Forces of the Committee on Armed Services, House of Representatives, One Hundred Twelfth Congress, First Session, Hearing Held October 14, 2011*, Washington, U.S. Government Printing Office, 2012.

61. United States Strategic Institute, *Strategic Review*, Washington, United States Strategic Institute, 1986.

62. Vincent, Joan. *Anthropology and Politics: Visions, Traditions, and Trends*, University of Arizona Press, 1994.

63. Waller, James, *Confronting Evil: Engaging Our Responsibility to Prevent Genocide*, Oxford University Press, 2016.

64. Wydra, Harald and Thomassen, Bjørn. *Handbook of Political Anthropology*, Cheltenham, Edward Elgar Publishing, 2018.

65. Yarhi-Milo, Keren, *Who Fights for Reputation: The Psychology of Leaders in International Conflict*, Princeton University Press, 2018.

66. Zarghani, Seyed H, *Measurement of National Power: Definitions, Functions, Measurement*, Saarbrücken, LAP LAMBERT Academic Publishing, 2010.

67. Zenko, Micah, *Toward Deeper Reductions in U.S. and Russian Nuclear Weapons*, New York, Council of Foreign Relations, 2010.

Journal Articles

1. Ahmad, Azhar, "Concept of National Power". *Strategic Studies*. Vol.32, no.2/2, 2011.

2. Ahmed, Khalid and Fatmi, Tariq, "The Role of Power in International Politics". *Pakistan Horizon*. Vol.24, no.4, 1971.

3. Baum, Seth D., De Neufville, Robert, and Barrett, Anthony M., *A Model For The Probability Of Nuclear War*, Global Catastrophic Risk Institution Working Paper 18-1, 2018.

4. Blackaby, Frank, "Time for a peasants' revolt". *The Bulletin of the Atomic Scientists.* Vol.53, no.6, 1997.

5. Blight, James G. How Might Psychology Contribute to Reducing the Risk of Nuclear War? *Political Psychology*. Vol.7, no.4, 1986.

6. Bunn, Matthew, "A Mathematical Model of the Risk of Nuclear Terrorism", *The Annals of the American Academy of Political and Social Science*. Vol. 607, 2006.

7. Churchill, Robert P, "Nuclear Arms as a Philosophical and Moral Issue". *The Annals of the American Academy of Political and Social Science*. Vol.469, 1983.

8. Cimbala, Stephen J., “Nuclear First Use: Prudence or Peril?” *Joint Force Quarterly*. Vol.51, no.4, 2008.

9. Cohen, Ronald. Research Directions in Political Anthropology. *Canadian Journal of African Studies/Revue Canadienne Des Études Africaines*. Vol.3, no.1, 1969.

10. Colangelo, Anthony J., Hayes, Peter. An International Tribunal for the Use of Nuclear Weapons. *Journal for Peace and Nuclear Disarmament*. Vol.2, no.1, 2019.

11. Dyer, Jim. The Psychopathology of Nuclear War. *Bulletin of the Royal College of Psychiatrists*. Vol.10, 1986.

12. Forsyth, James Wood. Nuclear Weapons and Political Behavior. *Strategic Studies Quarterly*. Vol. 11, no. 3, 2017.

13. Forrest, Frank R. Nuclear Terrorism and the Escalation of International Conflict. *Naval War College Review*. Vol.29, no.2, 1976.

14. French, Ferdinand C. The Concept of Law in Ethics. *The Philosophical Review*. Vol.2, no.1, 1893.

15. Gosnell, Harold F. Some Practical Applications of Psychology in Government. *American Journal of Sociology*. Vol. 28, no.6, 1923.

16. Hadžiabdić, Vahidin, Mehuljić, Midhat and Bektešević, Jasmin. Lotka-Volterra Model with Two Predators and Their Prey. *TEM Journal*. Vol. 6, no.1, 2017.

17. Kamp, Karl-Heinz, “An Overrated Nightmare”. *Bulletin of Atomic Scientists.* Vol.52, no.4, 1996.

18. Kutner, Luis. Politicide: The Necessity of an International Court of Criminal Justice. *Denver Journal of International Law & Policy*. Vol.2, no.1, 1972.

19. Larson, Deborah W. The Psychology of Nuclear Statecraft. *Diplomatic History*. Vol.15, no.3, 1991.

20. Mack, John E. Psychological effects of the nuclear arms race. *Bulletin of Atomic Scientists*. Vol. 37, no.4, 1981.

21. Maclver, Robert M. Ethics and Politics. *International Journal of Ethics*. Vol.20, no.1, 1909.

22. Maqsood, S. A. National Strength and the Use of Military Power. *Pakistan Horizon*. Vol.22, no.2, 1969.

23. Menkes, David, B. Psychological Defense Mechanisms and the Nuclear Arms Race: An Interactive Model. *Medicine and War*. Vol. 5, no.2, 1989.

24. Rachlinski, Jeffrey J., and Farina, Cynthia R. Cognitive Psychology and Optimal Government Design. *Cornell Law Review*. Vol.87, no.2, 2002.

25. Salter, Charles A, "Psychological Effects of Nuclear and Radiological Warfare". *Military Medicine*. Vol. 166, no.2, 2001.

26. Sluka, Jeffrey, Chomsky, Noam, and Price, David, "What Anthropologists Should Know about the Concept of Terrorism". *Anthropology Today*. Vol.18, no.2, 2002.

27. Stein, Janice, G. Building Politics into Psychology: The Misperception of Threat. *Political Psychology*. Vol.9, no.2, 1988.

28. Sułek, Mirosław. Measurement of national power – a powermetric model. *Przegląd Geopolityczny*. Vol.32, 2020.

29. Super, Charles W. Ethics and Law. *International Journal of Ethics*. Vol.19, no.1, 1908.

30. The International Committee of the Red Cross, "The Effects of Nuclear Weapons upon Human Health". *The International Committee of the Red Cross*. Information Note No.1, 2013.

31. Varma, Pradash V. Political Philosophy in the Modern Age. *The Indian Journal of Political Science*. Vol. 30, no.1, 1969.

32. Weisiger, Alex and Yarhi-Milo, Keren. Revisiting Reputation: How Past Actions Matter in International Politics. *International Organization*. Vol.69, no.2, 2015.

Dissertations

1. Henze, Tobias. *The UN Genocide Convention: An Empty Promise to Prevent Genocides After 1945?* Bachelor Thesis, Maastricht University, 2011.

2. Höhn, Karl Hermann, *Geopolitics and the Measurement of National Power*. PhD Dissertation, University of Hamburg, 2011.

3. Rodriguez, Alvarez, D., *Terrorism in Practice: The Guatemalan coup d'état in 1954*, Bachelor Degree Thesis, Lund University, 2019.

Online Resources

1. Aftergood, Steven. Pentagon Sees 'Increased Potential' for Nuclear Conflict. *Federation of American Scientists*. 2021. https://fas.org/blogs/secrecy/2021/07/increased-potential/

2. Alexis, Flynn. What is the theory of escalation? *Greenhead*. 2019. https://greedhead.net/what-is-the-theory-of-escalation/

3. Bugos, Shannon. Turkey Shows Nuclear Weapons Interest. *Arms Control Association*. 2019. https://www.armscontrol.org/act/2019-10/news/turkey-shows-nuclear-weapons-interest

4. Chen James. Nash Equilibrium. *Investopedia*. 2021. https://www.investopedia.com/terms/n/nash-equilibrium.asp

5. CK-12. Characteristics of Polynomial Graphs. *CK-12*. 2019. https://www.ck12.org/book/ck-12-interactive-algebra-ii-concepts-for-ccss/section/1.4/

6. Coalition for the International Criminal Court. The Crime of Aggression. *Coalition for the International Criminal Court*. n.d. https://www.coalitionfortheicc.org/explore/icc-crimes/crime-aggression

7. Collin, Jean-Marie. Nuclear weapons are illegal at last. *Greenpeace.* 2021. https://www.greenpeace.org/international/story/46233/nuclear-weapons-illegal-treaty/

8. Fauna Facts. Why do Spiders Sit in the Middle of their Webs? Fauna Facts. n.d. https://faunafacts.com/spiders/why-spiders-sit-in-middle-of-webs/

9. Ganter, Phil. Regression and Correlation. *Tennessee State University*. 2011. https://ww2.tnstate.edu/ganter/BIO%20311%20Ch%2012%20Regression.html

10. Global Firepower. 2021 Military Strength Ranking. *Global Firepower*. 2021. https://www.globalfirepower.com/countries-listing.php

11. Goldblum, Bethany. Modernization, Deterrence, and Cerutti's Political Philosophy. *The Nuclear Policy Working Group.* 2015. https://npwg.berkeley.edu/blog/modernization-deterrence-and-ceruttis-political-philosophy/

12. Gray, Mike. Garden Orb Weaving Spiders. Australian Museum. 2020. https://australian.museum/learn/animals/spiders/garden-orb-weaving-spiders/

13. Haines, John R. "Dirty Bombs:" Reasons to Worry. *Foreign Policy Research Institute*. 2014. https://www.fpri.org/article/2014/07/dirty-bombs-reason-to-worry/

14. Hayes, Adam. Game Theory. *Investopedia*. 2021. https://www.investopedia.com/terms/g/gametheory.asp

15. Hewitt, Steve. Terrorism by the State is still Terrorism. *University of Birmingham*. n.d. https://www.birmingham.ac.uk/research/perspective/terrorism-by-the-state-is-still-terrorism.aspx

16. International Committee of the Red Cross. Humanitarian impacts and risks of use of nuclear weapons. *International Committee of the Red Cross*. 2020. https://www.icrc.org/en/document/humanitarian-impacts-and-risks-use-nuclear-weapons

17. Kouskouvelis, Ilias. The Thucydides Trap: A Distorted Compass. *E-International Relations*. 2017. https://www.e-ir.info/2017/11/05/the-thucydides-trap-a-distorted-compass/

18. Kristensen, Hans M., and Korda, Matt. Nuclear Notebook: United States nuclear weapons, 2021. *Bulletin of the Atomic Scientists*. 2021. https://thebulletin.org/premium/2021-01/nuclear-notebook-united-states-nuclear-weapons-2021/

19. Kulacki, Gregory. China Joins the New Nuclear Arms Race with Hundreds of New Missile Silos. *All Things Nuclear*. 2021. https://allthingsnuclear.org/gkulacki/china-joins-the-new-nuclear-arms-race-with-hundreds-of-new-missile-silos/

20. Mabeza, Sarah. A date to remember: the banning of Nuclear Weapons in 2021. *International Committee of the Red Cross*. 2021. https://www.icrc.org/en/document/date-remember-banning-nuclear-weapons-2021

21. Mathematics Stack Exchange. Residuals vs fits Plot. *Mathematics Stack Exchange*. 2017. https://math.stackexchange.com/questions/2143107/residuals-vs-fits-plot/2143164

22. Mecklin, John. Disarm and Modernize. *Foreign Policy*. 2015. https://foreignpolicy.com/2015/03/24/disarm-and-modernize-nuclear-weapons-warheads/

23. Mehta, Aaron. Nuclear modernization speeding up as arms control on the brink: report. *Defense News*. 2020. https://www.defensenews.com/smr/nuclear-arsenal/2020/06/14/nuclear-modernization-speeding-up-as-arms-control-on-the-brink-report/

24. Natural Resources Biometrics. Chapter 7: Correlation and Simple Linear Regression. *Natural Resources Biometrics*. n.d. https://courses.lumenlearning.com/suny-natural-resources-biometrics/chapter/chapter-7-correlation-and-simple-linear-regression/

25. Nuclear Threat Initiative. *About the NTI Index and the Radioactive Source Security Assessment*. *Nuclear Threat Initiative*. (n.d.) https://www.ntiindex.org/about-the-nti-index/

26. Nuclear Weapons Ban Monitor. The Status of the TPNW. *Nuclear Weapons Ban Monitor*. 2021. https://banmonitor.org/tpnw-status

27. Pressenza. Over two-thirds of the world's countries support the TPNW. *Pressenza*. 2019. https://www.pressenza.com/2019/10/947931/

28. Pirolini, Alessandro. How Nuclear Warfare Affects the Environment. *AZoCleantech.* 2014. https://www.azocleantech.com/article.aspx?ArticleID=381

29. Rebane, Ramsus. Intrapersonal Communicology. *Soul Searching or Just Looking for Fights*. 2013. http://jeesusjalutasallveelaeval.blogspot.com/2013/12/intrapersonal-communicology.html

30. Sabga, Patricia. Nuclear Gulf: Is Saudi Arabia pushing itself into a nuclear trap? *Aljazeera*. 2020. https://www.aljazeera.com/economy/2020/7/21/nuclear-gulf-is-saudi-arabia-pushing-itself-into-a-nuclear-trap

31. Sarkar, Jayita. It's Time to Seriously Take Domestic Nuclear Terrorism Seriously. *Belfer Center.* 2021. https://www.belfercenter.org/index.php/publication/its-time-take-domestic-nuclear-terrorism-seriously

32. Schlosser, Eric. The Growing Dangers of the New Nuclear-Arms Race. *The New Yorker*. 2018. https://www.newyorker.com/news/news-desk/the-growing-dangers-of-the-new-nuclear-arms-race

33. Solomon, Jay. What Happens When Everyone's Trying to Get Nukes? *The Washington Institute for Near East Policy*. 2019. https://www.washingtoninstitute.org/policy-analysis/what-happens-when-everyones-trying-get-nukes

34. Statista. Nuclear Security Index for countries with weapon-usable nuclear materials worldwide in 2020. *Statista*. 2021. https://www.statista.com/statistics/278213/nuclear-materials-security-index/

35. *Status of World Nuclear Weapons*. (2021). Federation of American Scientists. https://fas.org/issues/nuclear-weapons/status-world-nuclear-forces/

36. The Correlates of War Project. National Military Capabilities (v4.0). *The Correlates of War Project.* (n.d.) https://correlatesofwar.org/COW2%20Data/Capabilities/NMC_v4_0.csv

37. United Nations. The Genocide Convention. United Nations. n.d. https://www.un.org/en/genocideprevention/genocide-convention.shtml

38. Van Westen, Cees. Vulnerability. *Caribbean Handbook on Risk Information Management*. n.d. http://www.charim.net/methodology/53

39. Xijin, Hu. China needs to increase nuclear capacity to maintain minimum deterrence against rising US coercion. *Global Times*. 2021. https://www.globaltimes.cn/page/202108/1230817.shtml