Adversarial conventional arms control in Europe: the quest for peace

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Budapest Agreement which promised respect for Ukraine's sovereignty in exchange for it giving up nuclear weapons, and then the 2014 Minsk Agreements were successful because they may have reduced the *likelihood* of a Russian invasion. Thus, it is both hard to be certain when the likelihood is reduced; and it strains credibility to conceive that the reduction of the likelihood of war is a form of success, even if war broke out.

This thesis offers a much clearer definition of success which is explained in chapters 5 and 6, and chapter 7 serves as a case study of CAC failure; yet at the same time, some cases still fall into gray areas of success or failure.

This thesis also offers new insights into war causation by defining clear, independent, and dependent variables, a task that is not easy given the interconnectedness of potential war causes.[54] Lastly, this thesis offers quantitative methods to measure delegation in CAC agreements and analyze the causal conditions of CAC agreement success and failure.

Chapter 2: Definitions of Core Concepts, Theoretical Frameworks, and Methodology

This thesis' topic of *Adversarial Conventional Arms Control in Europe* warrants some clarification in terms of the meaning of the core concepts contained in it. The topic is composed of four distinct elements that require clear definitions: adversarial relationships between states, conventional arms, arms control, and Europe. Adversarial arms control agreements are, as the term indicates, signed between adversaries. In brief, the goal is to end a conflict or reduce the likelihood of one by fixing a certain military balance and/or demilitarizing a certain geographic area to reduce areas of potential, military competition. CAC agreements stabilize an adversarial relationship through mutual agreement. Allies and partners would not make such an agreement as, in general, states are likely to prefer allies and partners to have stronger than weaker military capabilities.[55] The following sub-section unpacks and defines the concept in more detail with reference to the scholarly literature.

[54] Jack S Levy, "The Causes of War and the Conditions of Peace," *Annual Review of Political Science* 1:1 (1998): 28. War causation is complicated as causes exist at many levels, and analyzing different levels offer different insights. This dissertation focuses on organized group and systemic levels of war causation; see: Niels van Willigen and Benjamin Pohl, "2: The Causes of War," in *Global Challenges: Peace and War* (Leiden and Boston: Brill | Nijhoff, 2013), 29–41, https://doi.org/10.1163/9789004246935_004.

[55] For example, the US has often demanded that other NATO members spend more on defense, see Jordan Becker et al., "Transatlantic Shakedown: Presidential Shaming and NATO Burden Sharing," *Journal of Conflict Resolution*, April 21, 2023, 002200272311678, https://doi.org/10.1177/00220027231167840.

Adversarial

An adversarial relationship between states in the context of CAC refers to a relationship in which states are rivals across a range of areas, but especially security. This contrasts with states that may compete economically, perhaps fiercely so, but otherwise have a cooperative security relationship. An example of this may be the United States and Japan during the 1990's.[56] Similarly, states may have other disagreements, sometimes sharp, concerning migration, culture, crime, or minority issues but otherwise pose no perceived threat to one another militarily even if they are not partners or allies. An example of this relationship might be the US and Mexico. Both examples offer insights into the purpose and function of CAC. In the case of Japan and the US, Japan has always sought a robust US military capability and presence in the Pacific – which is the opposite of seeking a CAC agreement with the US. In the case of Mexico, while it is not a close US military ally, it is also not a military rival and it makes no substantive objection to increasing US military capabilities.[57]

In the context of CAC, rivalry refers to states that are in conflict, recently had a conflict, or fear conflict. Only one state in any given relationship, whether it is bilateral or multilateral, needs to have a perception of rivalry in order for an adversarial CAC agreement to become relevant. Thompson discusses rivalries in the context of militarized disputes but emphasizes that some relationships may be complicated or ambiguous enough that quantitatively determining their level of rivalry is difficult.[58] This can be especially true when partnerships and alliances are in flux, such as during the interwar period between the world wars.[59]

One of the key differences between adversarial arms control and universal or humanitarian-motivated arms control (discussed below) is that adversarial arms control is more

[56] Kristi Govella, "Economic Rivals, Security Allies: The US-Japan Trade War," in *Research Handbook on Trade Wars*, ed. Ka Zeng and Wei Liang (Edward Elgar Publishing, 2022), 209–29, https://doi.org/10.4337/9781839105708.00020.

[57] Up through the interwar period, the US and Mexico were military rivals to varying degrees. See, for example, Chris D. Dishman, *A Perfect Gibraltar: The Battle for Monterrey, Mexico, 1846*, Campaigns and Commanders (Norman OK: University of Oklahoma Press, 2010); Jeff Guinn, *War on the Border: Villa, Pershing, the Texas Rangers, and an American Invasion* (New York: Simon & Schuster, 2021).

[58] William R. Thompson, "Identifying Rivals and Rivalries in World Politics," *International Studies Quarterly* 45, no. 4 (December 2001): 557–86, https://doi.org/10.1111/0020-8833.00214.

[59] Richard Dean Burns and Donald Urquidi, *Disarmament in Perspective: Volume 4: Conclusions*, vol. 4 (Los Angeles: California State College at Los Angeles Foundation, 1968); Ian Ona Johnson, "How an International Order Died: Lessons from the Interwar Era," War on the Rocks, August 5, 2021, https://warontherocks.com/2021/08/how-an-international-order-died-lessons-from-the-interwar-era-2/; Andrew Webster, "Piecing Together the Interwar Disarmament Puzzle: Trends and Possibilities," *International Journal: Canada's Journal of Global Policy Analysis* 59, no. 1 (2004): 187–98, https://doi.org/10.1177/002070200405900109.

of a contractual arrangement between states, compared to other types of arms control which seek to establish global norms of behavior.[60] It is both rational and reasonable that states in an adversarial arms control agreement would withdraw from them if its adversary is in substantial violation of the agreement. Such an action, however, would in many cases be counterproductive in a universal arms control agreement. For example, states would not necessarily benefit by withdrawing from the Nuclear Non-Proliferation Treaty (NPT) or the Chemical Weapons Convention (CWC) to respond to violations.

Thus, there is no norm-building for CAC agreements as possession of conventional weapons in and of themselves – in most cases – is not viewed as contrary to global norms. Almost all conventional weapons and arms that were limited by a CAC treaty were otherwise widely acquired and fielded by armies around the world at that time.

Conventional

Conventional arms are generally easy to define although it is subject to some evolution or subjective definitions as technologies progress. Gillis defines conventional arms in a United Nations disarmament book as:

> a diverse range of weapons, perhaps more easily defined by what they are not (nuclear, chemical and biological weapons— the "weapons of mass destruction") than what they are. In practice, conventional weapons are commonly understood to include devices capable of killing, incapacitating or injuring mainly (though not exclusively) through explosives, kinetic energy or incendiaries. Conventional weapons include, but are not limited to, armoured combat vehicles (personnel carriers and tanks, for example), combat helicopters, combat aircraft, warships, small arms and light weapons, landmines, cluster munitions, ammunition and artillery.[61]

Omitted, likely unintentionally as the report focuses on the illicit trade of conventional weapons,[62] is that conventional weapons systems may also include supporting or enabling

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[60] Richard L Williamson, Jr., "Hard Law, Soft Law, and Non-Law in Multilateral Arms Control: Some Compliance Hypotheses," *Chicago Journal of International Law* 4, no. 1 (Spring 2003): 59–82.
[61] Melissa Gillis, "Conventional Arms and the Arms Trade," in *Disarmament: A Basic Guide*, Fourth Edition (United Nations, 2017), 71, https://www.un-ilibrary.org/content/books/9789213628027c017.
[62] Another UN definition makes similar omissions. "Conventional Arms," UNODA, accessed August 26, 2023, https://disarmament.unoda.org/conventional-arms/.

systems such as radar, logistics systems, intelligence collection and distribution assets, and other pieces of equipment that enable conventional weapons and capabilities. Lastly, the UN definition does not include personnel – which should be included in any definition as they were included in the post-World War One peace treaties and a later component of the CFE Treaty.[63]

One simple way to define conventional weapons is that they are any weapon or weapon system and their personnel that is not specifically designed and primarily used for the delivery and employment of chemical, biological, or nuclear weapons.[64]

One area in which there may be ambiguity is dual-use weapons or weapon systems. For example, a nuclear ballistic missile submarine is also capable of launching conventional missiles, and some ballistic missile designs can be configured for both conventional and non-conventional warheads. Many aircraft can deliver conventional and non-conventional weapons. Arms control and other agreements usually carefully define what systems do and do not fall under nuclear, biological, and chemical (NBC) restricted categories.

Other areas that may see the creation of their own military capabilities category for arms control purposes might include cyber warfare,[65] space-based systems,[66] and artificial intelligence.[67] One reason why these might fall outside of existing notions of conventional arms is because they do not necessarily exist in a single, geographic point in the manner of a radar, tank, ship, or aircraft.

Conventional arms are widespread, possessed by every state. Even if a country lacks a military, law enforcement agencies possess small arms. For most of human history, there was no differentiation between conventional and non-conventional weapons. Limitations on armed forces and capabilities stretches back to at least antiquity[68] wherein even ancient city-states, civilizations, and empires sought to establish agreements to stabilize rivalries and reduce the

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[63] "Concluding Act Of The Negotiation On Personnel Strength Of Conventional Armed Forces In Europe" (Helsinki, July 10, 1992).
[64] For a discussion of these, see Sico van der Meer et al., "CBRN Weapons: Where Are We in Averting Armageddon?," Clingendael Institute: Strategic Monitor 2019-2020, accessed October 17, 2023, https://www.clingendael.org/pub/2019/strategic-monitor-2019-2020/cbrn-weapons/.
[65] Thomas Reinhold, Helene Pleil, and Christian Reuter, "Challenges for Cyber Arms Control: A Qualitative Expert Interview Study," *Zeitschrift Für Außen- Und Sicherheitspolitik* 16, no. 3 (September 2023): 289–310, https://doi.org/10.1007/s12399-023-00960-w.
[66] Paul B Larsen, "Outer Space Arms Control: Can the USA, Russia and China Make This Happen," *Journal of Conflict and Security Law* 23, no. 1 (April 1, 2018): 137–59, https://doi.org/10.1093/jcsl/krw026.
[67] Matthijs M. Maas, "How Viable Is International Arms Control for Military Artificial Intelligence? Three Lessons from Nuclear Weapons," *Contemporary Security Policy* 40, no. 3 (2019): 285–311, https://doi.org/10.1080/13523260.2019.1576464; Forrest E Morgan et al., *Military Applications of Artificial Intelligence: Ethical Concerns in an Uncertain World*, 2020.
[68] Jeffrey Arthur Larsen, ed., *Arms Control: Cooperative Security in a Changing Environment* (Boulder, Colorado: Lynne Rienner Publishers, 2002), chap. 2.

threat of armed conflict.[69] There does not seem to be a specific term for pre-20th century efforts to control military capabilities through mutual agreement, but after World War 1 disarmament was the preferred term, then largely supplanted by arms control during the Cold War.

Arms Control

Larsen defines arms control "as any agreement among states to regulate some aspect of their military capability or potential."[70] Bull's definition, in contrast, focuses on the adversarial aspect of arms control, stating that "Arms control in its broadest sense comprises all those acts of military policy in which antagonistic states co-operate in the pursuit of common purposes even while they are struggling in the pursuit of conflicting one."[71]

Other scholars and experts have offered similar definitions and terminology. Kühn refers to arms control agreements between rivals as "cooperative" arms control.[72] Schofield, when defining adversarial arms control without using the term adversarial, states that "An arms control agreement is defined somewhat broadly as a bilateral or multilateral policy which attempts to regulate, limit or eliminate existing arsenals and prevent new ones, through either tacit or formal agreement, in order to reduce the incidence of inter-state violence."[73] The last phrase which refers to reducing "the incidence of inter-state violence" implies adversarial relationships.

Several types of arms control agreements serve different purposes, and it is common for scholars to bundle them together or not refer to the specific type of arms control issue when writing about it.

Universal arms control usually seeks to decrease the injury and suffering caused by armed conflict without regard to the balance of military power, the motivations behind a conflict, or a belligerent's goals. These agreements often prohibit certain weapons capabilities, with examples including the 1997 Ottawa Treaty which bans the use of anti-personnel land mines, or the 1992 Chemical Weapons Convention which outlaws the development, production, stockpiling, and use of chemical weapons. Other arms control agreements seek to generally reduce the likelihood of conflict between states, such as the Missile Technology

[69] Philip Towle, *Enforced Disarmament: From the Napoleonic Campaigns to the Gulf War* (Oxford: Oxford Univerity Press, 1997).
[70] Larsen, *Arms Control: Cooperative Security in a Changing Environment*, 1.
[71] Hedley Bull, "Arms Control and World Order," *International Security* 1, no. 1 (Summer 1976): 3.
[72] Kühn, *The Rise and Fall of Cooperative Arms Control in Europe*, 2020.
[73] Schofield, "Arms Control Failure and the Balance of Power," 748.

Control Regime (MTCR) which seeks to curb the proliferation of certain types of weapons such as ballistic missiles in the belief that if more countries have them, they can threaten global peace and stability. Notably, international arms export control regimes do not *prohibit* possession of the targeted weapon systems, but they are intended to make acquiring them more difficult. Both of these types of agreements can be made between allies and partners – in some cases even setting restrictions on one another.[74]

This dissertation's conception of adversarial CAC is closely intertwined with the European historical experience. Adversarial CAC agreements are concrete, specific agreements that often focus on specific military capabilities relevant to the adversarial, inter-state relationship in question. These agreements focus on weapons that are perceived to be most relevant – whether because of their use or potential use. CAC agreements between rivals outside of Europe would, in many cases, not be similar because other rivals might lack the military capabilities in question with no realistic need likelihood of them being acquired. These might include capital ships or heavy, long-range bombers. CAC in Europe is particular to Europe from many perspectives.

Europe

Defining Europe poses many challenges because it might incorporate different states depending on history, geology, geography, languages, religion, or international organization membership. Kühn defined Europe in *The Rise and Fall of Cooperative Arms Control in Europe* as all OSCE members. For this dissertation, however, this definition is too broad as it includes, as the OSCE itself states, states from North America, Europe, and Asia.[75] This dissertation excludes most states from Central Asia, but includes the southern Caucuses, United States and Canada (when the agreements are relevant to Europe).

The states included in this thesis' scope are determined by three considerations: the history of CAC in Europe over the last 100 years – that is which states have predominantly been involved in CAC agreements that affect continental Europe; membership in current Europe-focused institutions such as NATO and the European Union (EU); and what states are

[74] For example, pro-Ukraine coalition signatories of the Convention on Cluster Munitions, which prohibits use of these weapons, cannot legally provide them to Ukraine. Luke Harding and Michael Savage, "UK Will Not Supply Cluster Munitions to Ukraine, Says Sunak," *The Observer*, July 8, 2023, sec. World news, https://www.theguardian.com/world/2023/jul/08/ukraine-cluster-munitions-rishi-sunak-aid.
[75] "OSCE Participating States," OSC, OSCE, accessed October 22, 2023, https://www.osce.org/participating-states.

likely to have a substantial role and be considered state parties for a future CAC agreement in Europe.

There are several reasons why this thesis focuses on Europe and does not include other global regions. First, states in the same global region share common cultural, political, diplomatic, and institutional experiences; and that these do not transmit well even when institutions in different regions have similar purposes and face similar challenges.[76] Van Ham, for example, lays out the overlapping institutions in Europe that deal with arms control.[77]

Another reason to focus on CAC in Europe is that CAC in other global regions face different issues and histories – and they do not necessarily have as deep a history of CAC as Europe. For example, the Pacific region is much more concerned with naval balances of power than Europe. The Middle East faces a much more complicated quilt of geopolitics with less clear and less permanent partnerships and alliances. Europe, in contrast, has been dominated by a primarily dyadic rivalry since the end of World War Two. South America has a limited need for CAC agreements as the past 100 years suggest a low threat of large-scale interstate conflict.

Lastly, one of this thesis' goals is to address the current and severe NATO-Russia rivalry by understanding past CAC agreements that might be relevant to any future agreements.

Single Definition

The overall definition that this dissertation adopts for adversarial conventional arms control in Europe is:

The control of conventional military systems and capabilities through formally agreed, measurable, and quantitative and/or geographic restrictions, reductions, and limitations made between states who have a relationship characterized, or recently characterized, by a militarized rivalry. Europe is broadly defined as the states that have deep cultural, historical, military, and security interests, relationships, and institutional ties to Europe defined by the

[76] Thomas Sommerer and Jonas Tallberg, "Diffusion Across International Organizations: Connectivity and Convergence," *International Organization* 73, no. 02 (Spring 2019): 399–433, https://doi.org/10.1017/S0020818318000450.
[77] Peter van Ham, *Modernizing Conventional Arms Control in the Euro-Atlantic Region* (The Hague: Netherlands Institute of International Relations 'Clingendael'., 2018).

land mass which runs from approximately Iceland to the Urals, and from the Arctic Ocean to Türkiye.

Theories and Conceptual Frameworks

This thesis creates a theoretical and conceptual framework that encompasses an adversarial CAC agreement's lifecycle from conception to implementation based on the notion that the balance of military capabilities between adversaries underlies CAC agreements. From inception through implementation, states are mindful of the military balance and continuously assess it through various means and attempt to discern if the agreement fixes and keeps the desired balance.

Recent works on CAC have been policy-driven, aiming to offer specific options for future CAC measures or assessing the current state of NATO/US-Russian CAC relations.[78] However, a theoretical framework is necessary to understand the essence of CAC agreements, especially when attempting to compare and analyze over 30 agreements over the course of 100 years and agreements that go beyond some version of the NATO/US-Russia/USSR relationship.

Because this thesis' central chapters, chapters 4-7, delve into greater theoretical detail, this chapter will only provide a broad overview of how the chapters fit together theoretically and offer a summary of the relevant International Relations and international organization theories.

CAC Agreement Stages

This thesis categorizes CAC agreements into three distinct phases, or stages: the baseline, negotiation, and implementation stages (see Figure 2). The baseline stage is composed of the phenomenon that compels a state to consider and pursue a CAC agreement. States' CAC considerations are often driven by considerations of the status quo, including the military balance and how deterrence, the security dilemma, and the offense-defense balance define the existing security relationship. More specifically, states will determine what their upper and lower limits might be in terms of equipment limitations and geographic restrictions based on

[78] Samuel Charap et al., *A New Approach to Conventional Arms Control in Europe: Addressing the Security Challenges of the 21st Century* (RAND Corporation, 2020), https://doi.org/10.7249/RR4346; van Ham, *Modernizing Conventional Arms Control in the Euro-Atlantic Region*.

their assessment of the existing status quo. For example, they may determine the minimum number of battle tanks they need to retain in order to ensure deterrence, the maximum number of battle tanks they would permit a rival to retain while not feeling threatened, or the removal from consideration of ballistic missile defenses due to a belief that these are more defensive than offensive. States might seek to reduce any relative differences in military capabilities within a CAC, but no agreement will be made that seeks to invert the military power balance or the operational situation.

The negotiation stage covers the elements that drive the discussions, compromises, and considerations between states during which they communicate their goals and preferences, often formulated around deterrence, the security dilemma, and the offense-defense balance. During the negotiation stage states grapple with different perceptions of these three phenomena, sometimes struggling to find the balance between maintaining a deterrence without threatening the other side and identifying military capabilities that offer more offensive rather than defensive capabilities. Though negotiations are an essential component of CAC agreements, this dissertation's main focus on the negotiation stage is how states perceive the military status quo prior to and during CAC agreement negotiation, and then the final CAC agreement's details retain or alter the status quo.

This dissertation only offers limited coverage of the negotiation stage due to a combination of source material availability, complexity, and diversity of each case's negotiations, and focuses on the motivations of states entering into a CAC agreement (the baseline stage) and whether agreements succeed (the implementation stage).

The implementation stage covers the agreement's life after entry into force until its demise or expiration (as applicable) and is driven by monitoring, verification, and enforcement considerations as well as geopolitical developments. The issue of the military balance remains as states are concerned that cheating might shift the military balance away from what was agreed, or that other non-prohibited activities might shift the balance such as changes in alliances or military technology.

This dissertation focuses on the structural analysis of international relations and how CAC agreements fit within this. Concrete comparisons of force ratios and the military balance reflect structural differences in national strength and power, which, quantitatively, are fixed numbers and ratios regardless of who is in power. That is, ten battleships, 500 combat aircraft, or 5000 tanks are the same no matter who a state's leader is. But, this is not to say that CAC is not somewhat dependent on individual leaders' decisions. The leaders may be the drivers of threat perceptions. They may be the loudest voice in a country articulating threat perceptions posed by other states and rivals, or they may be the loudest voices threatening other states and rivals. Morgenthau discusses the role of statesmen and leaders in the context of interstate competition and international relations.[79]

Schafer and Walker emphasize the role of individuals and their belief systems in international relations.[80] For CAC, leaders' belief in their efficacy or skepticism in their effectiveness may serve as a gateway between stages 1 and 2. If a leader is generally skeptical of CAC, they might be unwilling to engage in negotiations – at least for certain peacetime agreements which lack an immediate and pressing need for consideration and passage (compared to ones linked to conflict termination). In contrast, a leader might have a strong belief and preference for CAC and actively seek such agreements even when the need is uncertain or in the face of domestic political obstacles.

One of this dissertation's goals is to attempt to explore how CAC agreements are made from a structural perspective. It attempts to identify and assess various aspects of interstate relations and to quantify these as much as possible. However, decisions are ultimately made by people, agreements are negotiated by people, and people implement the agreements. Allison emphasizes the role at three levels of decision making, for example.[81] These three levels apply to any CAC agreement, though there would likely be considerable variation in the decisions that resulted in finalizing each agreement.

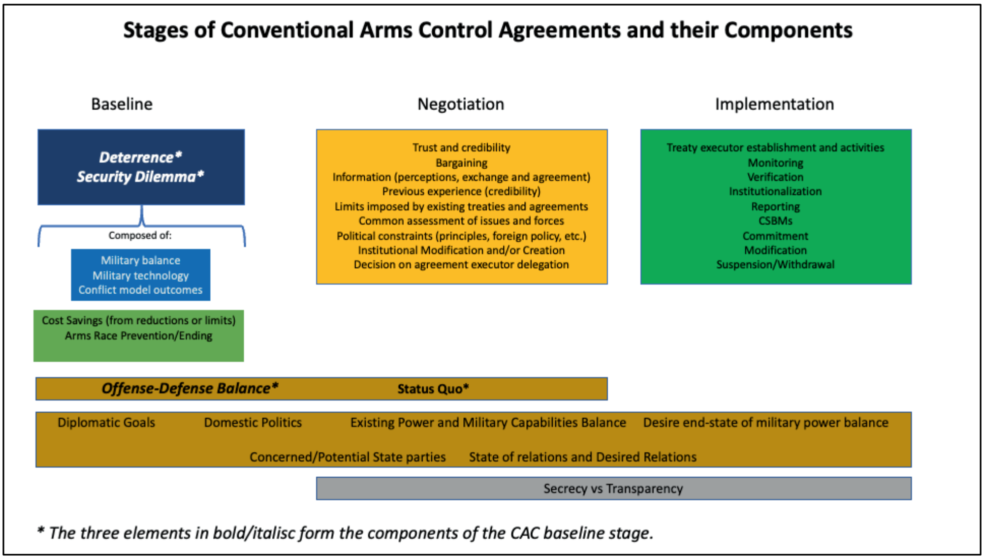
For several agreements – especially those made during peacetime, during which an agreement was optional – leaders' personal relationships may be critical, although both a detailed case study and counterfactual assessment would be necessary to increase confidence in such a conclusion. Two relationships that might have been key to CAC are the Reagan-Gorbachev (the INF Treaty, which included conventional land-based missiles) and the Bush-Gorbachev (the CFE Treaty) relationships.[82] Interpersonal relationships likely affect the willingness to consider arms control agreements, then the tone of negotiations, and then the willingness to sign agreements and ensure their entry into force. It is unclear to what extent

[79] Hans J. Morgenthau, *Politics among Nations : The Struggle for Power and Peace*, [1st ed.] (New York: A.A. Knopf, 1948).
[80] Mark Schafer and Stephen G. Walker, *Beliefs and Leadership in World Politics : Methods and Applications of Operational Code Analysis*, 1st ed, 1 online resource (xiv, 288 pages) : illustrations vols., Advances in Foreign Policy Analysis (New York: Palgrave Macmillan, 2006), https://doi.org/10.1057/9781403983497.
[81] Graham T. Allison, *Essence of Decision : Explaining the Cuban Missile Crisis* (Boston: Little, Brown and Company, 1971).
[82] Thomas S Blanton and Svetlana Savranskaya, *The Last Superpower Summits. Gorbachev, Reagan, and Bush. Conversations That Ended the Cold War* (Hungary: Central European University Press, 2016); Matlock Jr., *Reagan and Gorbachev: How the Cold War Ended* (New York: Random House, 2004); Svetlana Savranskaya and Thomas S. Blanton, eds., *Reagan, Gorbachev and Bush. Conversations That Ended the Cold War.* (Budapest, Hungary: Amsterdam University Press, 2016), https://doi.org/doi:10.1515/9789633861714.

personal relationships impact implementation. Decisions to comply or violate agreements might be closely intertwined with personal relationships. Poor relations might motivate a leader to engage in violations, while positive relations might encourage compliance. At the same time, violations or compliance might create poor or positive relations, respectively.

Personal relationships might impact implementation, for example, willingness to alter and adapt agreements to changing circumstances or how to respond to violations. A positive relationship might create a greater willingness to collaborate to alter agreements, and it might make a leader both more reluctant to declare that a rival state violated an agreement and impact sanctions' speed and severity.

Figure 2: Stages of conventional arms control agreements and their components

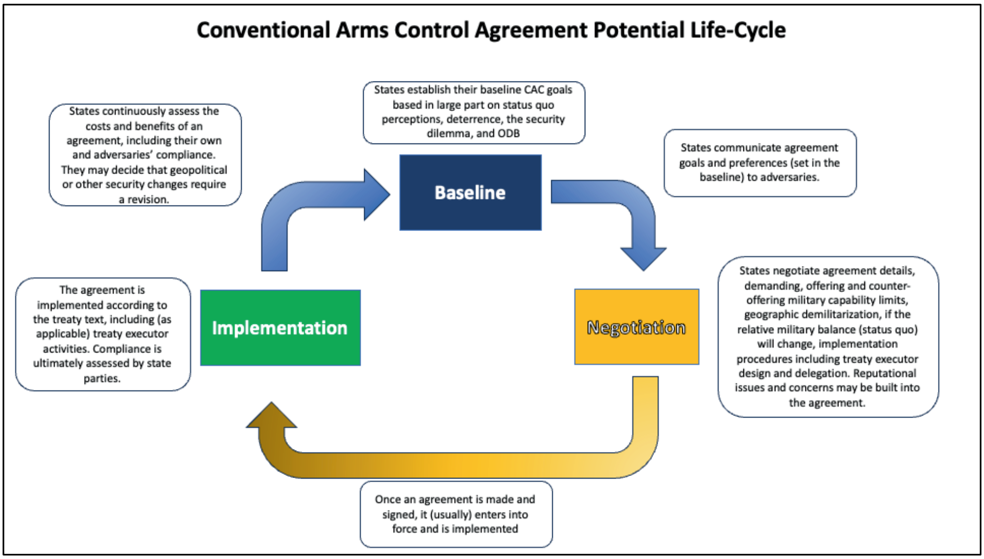


Source: Author's elaboration

CAC agreements can follow a circular process – even if it spans several decades – in which new information, experiences, military advances, and geopolitical changes compel states in a CAC agreement to revisit that agreement (see Figure 3). The stages are composed of sometimes overlapping and interrelated areas of theory and policy consideration, and the stages themselves are interrelated. For example, a state seeking a CAC agreement will first determine which other states may pose a threat, and then seek to include these state parties in negotiations.

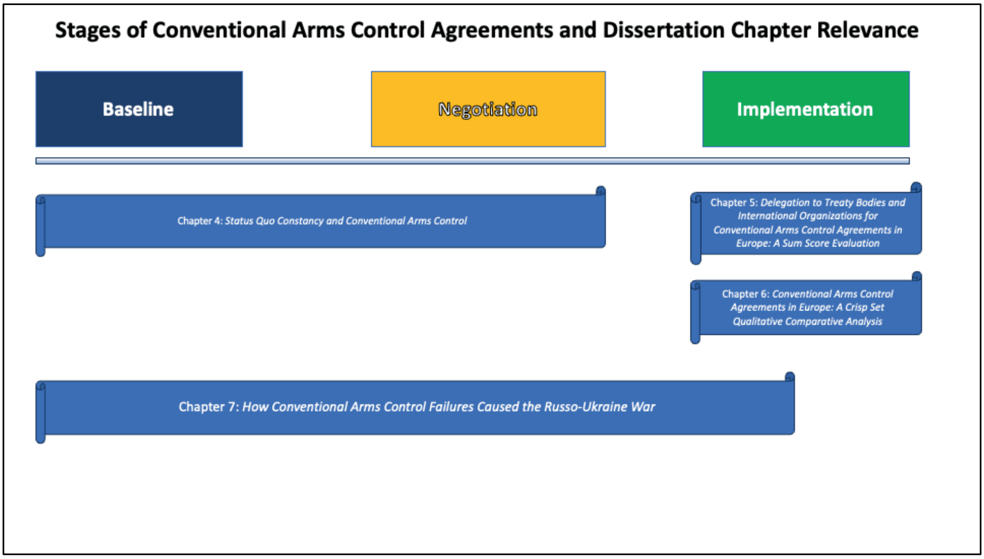
Negotiations will partly be driven by what is believed to be verifiable. Figure 4 shows how each of this dissertation's chapters fall into the different CAC stages.

Figure 3: Conventional arms control agreement potential life-cycle



Source: Author's analysis

Figure 4: Stages of conventional arms control agreements and dissertation chapter relevance



Source: Author's elaboration

Theoretical disciplines and CAC

This dissertation study of CAC focuses on two International Relations sub-theoretical areas: international security and international organization (IO, also referred to as Intergovernmental Organization (IGO)) theories). These are summarized in tables 1 and 2.

International Relations and security theories are deemed relevant to CAC agreements when they substantially apply to how an agreement is conceived, negotiated, or implemented. The theories below (Table 2 below) are presented in alphabetical order, though their applicability can differ depending on the agreement or agreement stage. This table identifies the relevant IR theory to CAC, explains how it is relevant to CAC, and offers several references from which the relevance is ascertained. The references below do not necessarily directly reference CAC, but they articulate the theory that is relevant to CAC.

Table 2: CAC and international security theories

Theory	Relevance to CAC	References
Arms Racing	CAC is often conceived to halt or prevent arms racing. By setting limits, states can avoid obtaining military capabilities that, after considerable expense, do not offer increased, relative military strength compared to an adversary if they have likewise obtained similar capabilities.	• Brito and Intriligator, "The Economics of Disarmament, Arms Races and Arms Control."[83] • Downs, Rocke, and Siverson, "Arms Races and Cooperation."[84] • Glaser, "When Are Arms Races Dangerous? Rational versus Suboptimal Arming."[85] • Kydd, "Arms Races and Arms Control."[86] • Trachtenberg, "The Past and Future of Arms Control."[87]
Bargaining	States engage in bargaining across a range of issues. Formal negotiations to close a CAC agreement involve a range of matters including bargaining positions, negotiating strength, compromises, past experiences, reputation, and the Prisoner's dilemma. CAC adversaries are likely to seek concessions from an adversary while retaining as much capability as their adversary will permit. Information exchange and converging assessments on a range of issues, including deterrence, the security dilemma, and the ODB are often essential in CAC negotiations.	• Fearon, "Bargaining, Enforcement, and International Cooperation."[88] • Levy, "Loss Aversion, Framing, and Bargaining: The Implications of Prospect Theory for International Conflict."[89] • Miller, "Hard Times for Arms Control What Can Be Done?"[90]
Cooperation and Trust	States cooperate based on combinations of trust and mutual interest to realize mutual gains. CAC requires that states cooperate first to arrive at an agreement, and then implement the agreement successfully. Trust comes into play as states need to trust one another that negotiations are in good faith, that all relevant information is revealed during negotiations, and that states will faithfully implement agreements. Despite even vigorous verification and monitoring measures, states may still cheat or they may otherwise engage in non-cooperative, non-trusting behavior to undermine the agreement.	• Abbott, "Trust But Verify: The Production of Information in Arms Control Treaties and Other International Agreements."[91] • Claeys and Williams, "War and Arms Control."[92] • Evangelista, "Cooperation Theory and Disarmament Negotiations in the 1950s."[93] • Hinde, "Trust, Co-Operation, Commitment and International Relationships."[94] • Jervis, "Cooperation Under the Security Dilemma."[95] • Oye, Cooperation under Anarchy.[96]

[83] Dagobert L. Brito and Michael David Intriligator, "The Economics of Disarmament, Arms Races and Arms Control," *Économie Appliquée*, 1993, 59–76.
[84] George W Downs, David M Rocke, and Randolph M. Siverson, "Arms Races and Cooperation," *World Politics* 38, no. 1 (October 1985): 118–46.
[85] Charles L. Glaser, "When Are Arms Races Dangerous? Rational versus Suboptimal Arming," *International Security* 28, no. 4 (2004): 44–84.
[86] Andrew Kydd, "Arms Races and Arms Control: Modeling the Hawk Perspective," *American Journal of Political Science* 44, no. 2 (April 2000): 228–44, https://doi.org/10.2307/2669307.
[87] Marc Trachtenberg, "The Past and Future of Arms Control," *Daedalus* 120, no. 1 (Winter 1991): 203–16.
[88] James D. Fearon, "Bargaining, Enforcement, and International Cooperation," *International Organization* 52, no. 2 (1998): 269–305, https://doi.org/10.1162/002081898753162820.
[89] Jack S. Levy, "Loss Aversion, Framing, and Bargaining: The Implications of Prospect Theory for International Conflict," *International Political Science Review / Revue Internationale de Science Politique*, Crisis, Conflict and War, 17, no. 2 (April 1996): 179–95.
[90] Miller, *Hard Times for Arms Control What Can Be Done?*
[91] Kenneth W. Abbott, "Trust But Verify: The Production of Information in Arms Control Treaties and Other International Agreements," *Cornell International Law Journal* 26, no. 2 (Winter 1993): 1–58.
[92] Suzanne Claeys and Heather W. Williams, "War and Arms Control: When to Pursue Cooperation," *Survival* 64, no. 6 (November 2, 2022): 137–52, https://doi.org/10.1080/00396338.2022.2150432.
[93] Matthew Evangelista, "Cooperation Theory and Disarmament Negotiations in the 1950s," *World Politics* 42, no. 4 (July 1990): 502–28.
[94] Robert A. Hinde, "Trust, Co-Operation, Commitment and International Relationships," *Current Research on Peace and Violence* 10, no. 2/3 (1987): 83–90.
[95] Robert Jervis, "Cooperation Under the Security Dilemma," *World Politics* 30, no. 2 (January 1978): 167–214.
[96] Kenneth A. Oye, ed., *Cooperation under Anarchy* (Princeton, N.J: Princeton University Press, 1986).

Theory	Relevance to CAC	References
		• Stiles, Trust and Hedging in International Relations.[97]
Conventional Warfare	Existing theories, trends, and current experiences with conventional warfare are essential to CAC. Knowledge of conventional warfare can provide important information about a state's military capabilities, weapon performance, tactics, and potential changes in technology that might affect CAC.	• Dupuy et al., "Handbook on Ground Forces Attrition in Modern Warfare."[98] • Mearsheimer, "Assessing the Conventional Balance."[99] • Posen, "Measuring the European Conventional Balance."[100] • Shlapak, Johnson, and Rand Corporation, "Reinforcing Deterrence on NATO's Eastern Flank."[101]
Deterrence	States considering or entering into CAC often seek to establish deterrence by limiting the other side's military capabilities, or retain deterrence despite reductions and limitations. The need to maintain deterrence can make arriving at a peacetime CAC agreement difficult.	• Driver, "Deterrence in Eastern Europe in Theory and Practice."[102] • Haffa, "The Future of Conventional Deterrence."[103] • Hastedt and Eksterowicz, "Conventional Arms Control."[104] • Mazarr et al., "What Deters and Why: Exploring Requirements for Effective Deterrence of Interstate Aggression."[105] • Mearsheimer, *Conventional Deterrence*.[106]
Diplomacy	CAC is often part of a larger diplomatic effort to improve relations. Diplomacy related to CAC incorporates a wide range of state activities, including relationships with neutral states and international organizations. Diplomacy is important throughout the CAC life-cycle, including in how to initially agree to negotiate an agreement, the treaty negotiations themselves including formal and informal linkage to other issues, and then issues of compliance during implementation.	• Crawford and Vu, "Arms Control as Wedge Strategy."[107] • Goldblat, "Arms Control: The New Guide to Negotiations and Agreements."[108] • Jervis, "From Balance to Concert: A Study of International Security Cooperation."[109] • Jervis, "Perception and Misperception in International Politics."[110]

[97] Kendall Stiles, *Trust and Hedging in International Relations* (Ann Arbor, MI: University of Michigan Press, 2018), https://doi.org/10.3998/mpub.9750852.
[98] Trevor N. Dupuy et al., *Handbook on Ground Forces Attrition in Modern Warfare* (Fairfax, VA: The Historical Evaluation and Research Organization, 1986).
[99] John J. Mearsheimer, "Assessing the Conventional Balance: The 3:1 Rule and Its Critics," *International Security* 13, no. 4 (Spring 1989): 54, https://doi.org/10.2307/2538780.
[100] Barry R. Posen, "Measuring the European Conventional Balance: Coping with Complexity in Threat Assessment," *International Security* 9, no. 3 (Winter -1985 1984): 47–88, https://doi.org/10.2307/2538587.
[101] David A Shlapak, Michael W. Johnson, and Rand Corporation, *Reinforcing Deterrence on NATO's Eastern Flank: Wargaming the Defense of the Baltics*, 2016, http://www.jstor.org/stable/10.7249/j.ctt19w71fs.
[102] Darrell Driver, "Deterrence in Eastern Europe in Theory and Practice," *Connections, Partnership for Peace Consortium of Defense Academies and Security Studies*, Deterrence in International Security: Theory and Current Practice, 18, no. 1 (Winter-Spring 2019): 15.
[103] Robert P Haffa Jr, "The Future of Conventional Deterrence," *Strategic Studies Quarterly* 12, no. 4 (Winter 2018): 23.
[104] Glenn Hastedt and Anthony Eksterowicz, "Conventional Arms Control: Clearing Away the Underbrush," *Defense Analysis* 4, no. 2 (1988): 181–84, https://doi.org/10.1080/07430178808405346.
[105] Michael Mazarr, Joe Cheravitch, et al., *What Deters and Why: Applying a Framework to Assess Deterrence of Gray Zone Aggression* (RAND Corporation, 2021), https://doi.org/10.7249/RR3142.
[106] John J Mearsheimer, *Conventional Deterrence* (Ithica and London: Cornell University Press, 1983).
[107] Timothy W. Crawford and Khang X. Vu, "Arms Control as Wedge Strategy: How Arms Limitation Deals Divide Alliances," *International Security* 46, no. 2 (Fall 2021): 91–129, https://doi.org/10.1162/isec_a_00420.
[108] Jozef Goldblat, *Arms Control: The New Guide to Negotiations and Agreements* (Los Angeles, CA; London: SAGE, 2002).
[109] Robert Jervis, "From Balance to Concert: A Study of International Security Cooperation," *Daedalus*, 50 Years, 134, no. 4 (Fall 2005): 101–17.
[110] Robert Jervis, *Perception and Misperception in International Politics*, New edition (Princeton, New Jersey: Princeton University Pres, 2017).

Theory	Relevance to CAC	References
Offense-Defense Balance	The ODB informs states which weapons they are more likely to want to limit because of their perceived offensive advantages, or have exempted from limitations because of their primarily defensive capabilities.	• Biddle, "Rebuilding the Foundations of Offense-Defense Theory."[111] • Levy, "The Offensive/Defensive Balance of Military Technology."[112] • Goldfischer, "The Meaning of Offense and Defense."[113] • Lynn-Jones, "Offense-Defense Theory and Its Critics."[114]
Security Dilemma	States entering into a CAC agreement, especially during peace time, may seek to resolve the security dilemma through mutual limitations so that neither feels threatened by the other.	• Glaser, "The Security Dilemma Revisited."[115] • Jervis, "Cooperation Under the Security Dilemma."[116] • Montgomery, "Breaking Out of the Security Dilemma: Realism, Reassurance, and the Problem of Uncertainty."[117]
War Causation	CAC and war causation may be related in some cases, with CAC decreasing the likelihood of conflict between states – which is in many cases its intention. The breakdown of CAC agreements can signal impending conflict, with CAC deterioration potentially being a cause of conflict.	• Jervis, "Arms Control, Stability, and Causes of War."[118] • Mathews III, "Current Gains and Future Outcomes: When Cumulative Relative Gains Matter."[119] • Trachtenberg, "The Past and Future of Arms Control."[120] • Van Evera, "Causes of War".[121]

Source: Author's literature review and research

The scholarship on IO theory concerning CAC agreements is limited for several reasons. First, many CAC agreement executors may not comfortably fall in the category of an IO because they lack any independence or agency, being composed of a meeting body of national representatives rather than international civil servants and an independent head. This is concretely manifested in the lack of a permanent secretariat in stark contrast to IOs which maintain a permanent office, staff, and head. However, agreement executors such as the CFE Treaty's Joint Consultative Group (JCG) are not ad-hoc or informal – they are permanent bodies created by international treaties. For this reason, they fall between a full IO and an

[111] Stephen Biddle, "Rebuilding the Foundations of Offense-Defense Theory," *The Journal of Politics* 63, no. 3 (August 2001): 741–74, https://doi.org/10.1111/0022-3816.00086.
[112] Jack S. Levy, "The Offensive/Defensive Balance of Military Technology: A Theoretical and Historical Analysis," *International Studies Quarterly* 28, no. 2 (June 1984): 219–38, https://doi.org/10.2307/2600696.
[113] David Goldfischer, "1. The Meaning of Offense and Defense," in *The Best Defense* (Cornell University Press, 2020), 13–37, https://doi.org/10.7591/9781501736681-004.
[114] Sean Lynn-Jones, "Offense-Defense Theory and Its Critics," *Security Studies* 4, no. 4 (Summer 1995): 660–91.
[115] Charles L. Glaser, "The Security Dilemma Revisited," *World Politics* 50, no. 1 (October 1997): 171–201, https://doi.org/10.1017/S0043887100014763.
[116] Jervis, "Cooperation Under the Security Dilemma."
[117] Evan Braden Montgomery, "Breaking Out of the Security Dilemma: Realism, Reassurance, and the Problem of Uncertainty," *International Security* 31, no. 2 (Fall 2006): 151–85.
[118] Robert Jervis, "Arms Control, Stability, and Causes of War," *Daedalus* 120, no. 1 (Winter 1991): 167–81.
[119] John C. Mathews III, "Current Gains and Future Outcomes: When Cumulative Relative Gains Matter," *International Security* 21, no. 1 (Summer 1996): 112–46.
[120] Trachtenberg, "The Past and Future of Arms Control."
[121] Stephen Van Evera, *Causes of War* (Ithica and London: Cornell University Press, 1999), http://www.jstor.org/stable/10.7591/j.ctt24hg70.

informal intergovernmental organization (IIGO).[122] Arribas discusses different categories and types of IOs, with a focus on their legal standing, but does not delve into detail about the types of treaty bodies formed from arms control treaties.[123]

Second, many CAC agreement executors' work is narrow and focused, keeping them outside of public engagement and services. There is scholarship, for example, on IOs and their relationship with citizens[124] or their efforts to establish legitimacy;[125] but neither is applicable to CAC agreements because of their focus on government-to-government relationships and military forces.

Treaty agreement executors with narrow mandates and minimal agency or independence are unlikely to be the subject of state or populist criticism.[126] A caveat, here, however, must be made. Some IOs such as the OSCE may be engaged in CAC issues (inspections and monitoring) alongside other tasks. In Ukraine, the OSCE's SMM was charged with implementing the Minsk agreements, but the OSCE *writ large* also conducted other activities and ran other projects. In such a situation, IOs are more likely to confront performance, legitimacy, and authority challenges in matters outside of CAC agreement tasks. However, states may compete with one other to obtain IOs' support if the IOs themselves have agency.[127] While this does not apply to small, limited treaty executors with no or little agency (such as the CFE's JCG), this may apply to larger executors especially when they are part of a multi-purpose organization, such as the EU or OSCE.

The extent to which treaty executors are independent or autonomous is discussed in chapter 5. Brown offers substantial insight into the notion of how much states delegate

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122 Felicity Vabulas and Duncan Snidal, "Organization without Delegation: Informal Intergovernmental Organizations (IIGOs) and the Spectrum of Intergovernmental Arrangements," *The Review of International Organizations* 8 (June 2013): 193–220, https://doi.org/10.1007/s11558-012-9161-x; Oliver Westerwinter, Kenneth W. Abbott, and Thomas Biersteker, "Informal Governance in World Politics," *The Review of International Organizations* 16, no. 1 (2021): 1–27, https://doi.org/10.1007/s11558-020-09382-1.

123 Gloria Fernández Arribas, "Rethinking International Institutionalisation through Treaty Organs," *International Organizations Law Review* 17, no. 2 (2020): 457–83, https://doi.org/10.1163/15723747-2019012.

124 Thomas Bernauer, Steffen Mohrenberg, and Vally Koubi, "Do Citizens Evaluate International Cooperation Based on Information about Procedural and Outcome Quality?," *The Review of International Organizations* 15, no. 2 (April 2020): 505–29, https://doi.org/10.1007/s11558-019-09354-0.

125 Jonas Tallberg and Michael Zürn, "The Legitimacy and Legitimation of International Organizations: Introduction and Framework," *The Review of International Organizations* 14, no. 4 (December 2019): 581–606, https://doi.org/10.1007/s11558-018-9330-7.

126 For a brief history of IOs and how states have viewed them as instruments of state power (principle-agent theory) or how they have obtained their own independence, see Dennis Dijkzeul and Dirk Salomons, eds., *International Organizations Revisited: Agency and Pathology in a Multipolar World* (New York: Berghahn Books, 2021).

127 Hylke Dijkstra, "Collusion in International Organizations: How States Benefit from the Authority of Secretariats," *Global Governance: A Review of Multilateralism and International Organizations* 23, no. 4 (2017): 601–19, https://doi.org/10.1163/19426720-02304006.

authority to IOs, and he develops a methodology to measure this.[128] Hooghe elaborates on the notion of delegation by comparing it with pooling, which refers to formal decision-making processes within an IO.[129] Sommerer and Tallberg discuss how information and knowledge are diffused between IOs, mentioning security-related organizations such as the OSCE and NATO, though they do not address arms control directly.[130] The notion, however, that information and knowledge diffuses across IOs through formal connections, through common work, and through staff changes is important for how CAC experience in Europe might be retained and carried over into future agreements.

Lake takes a broader view of IOs, focusing on security institutions (with institutions in his terminology being comparable to IOs) as mechanisms to grapple with the inherent nature of the anarchic international system.[131] He states that security institutions are formed (and these can include CAC agreements and their executors) because "Institutions do matter, and they are likely to matter in security affairs precisely because important national goals are at risk."[132]

IO theory is of utmost relevance and importance to CAC agreements, and vice versa. Negotiating state parties need to make choices in how they seek and agree to implement a CAC agreement, and involvement or creation of an IO is one of those choices. This is a comparatively major decision, as the involvement of an IO can significantly impact monitoring, verification, and confidence in state parties' compliance. Table 3 identifies the relevant IO theory to CAC, explains how it is relevant to CAC, and offers several references from which the relevance is ascertained. The references below do not necessarily directly reference CAC, but they articulate the theory that is relevant to CAC.

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[128] Robert L. Brown, "Measuring Delegation," *The Review of International Organizations* 5, no. 2 (November 19, 2009): 141–75, https://doi.org/10.1007/s11558-009-9076-3.
[129] Liesbet Hooghe and Gary Marks, "Delegation and Pooling in International Organizations," *The Review of International Organizations* 10, no. 3 (2015): 305–28, https://doi.org/10.1007/s11558-014-9194-4.
[130] Sommerer and Tallberg, "Diffusion Across International Organizations."
[131] David A. Lake, "Beyond Anarchy: The Importance of Security Institutions," *International Security* 26, no. 1 (Summer 2001): 129–60.
[132] Lake, 158.

Table 3: CAC and international organization theory

Theory	Relevance to CAC	References
Delegation	Delegation is a key question in negotiating and implementing a CAC agreement. Negotiating parties can discuss and decide what role a third-party state or IO might have in implementing the agreement, including its tasks, mandate, authority, composition, and resources. During the implementation stage, states may delegate functions to an agreement executor, which may be created or tasked with some or many implementation tasks. Delegation itself is composed of several elements, as discussed in Chapter 5.	• Abbott and Snidal, "Hard and Soft Law in International Governance." • Brown, "Measuring Delegation." • Haftel and Thompson, "The Independence of International Organizations." • Hooghe and Marks, "Delegation and Pooling in International Organizations."
Institutional and IO Design	CAC treaties may implemented by more than a singular treaty executor, but through a set of overlapping agreements, tacit agreements, institutions, and processes. These may be formally or informally incorporated in a CAC agreement, or evolve over the agreement's lifetime.	• Duffield, "What Are International Institutions?" • Haftel and Thompson, "The Independence of International Organizations." • Haftel and Thompson, "The Independence of International Organizations." • Reddie, Governing Insecurity: Institutional Design, Compliance, and Arms Control.
Institutional and IO Adaptation	Following the formal agreement of a CAC, usually defined as the date of signature (rather than entry into force), military and geopolitical changes can occur which might substantially affect an agreement's relevance or state parties' cost-benefit calculations even if all states are fully compliant. The extent to which the treaty, its institutions, and the agreement executor can adapt to these changes can impact the treaty's survivability.	• Kühn, "Institutional Resilience, Deterrence and the Transition to Zero Nuclear Weapons." • Kühn, The Rise and Fall of Cooperative Arms Control in Europe. • Smith, "Understanding Dynamic Obligations: Arms Control Agreements." • Tallberg et al., The Opening Up of International Organizations.

Source: Author's literature review and research

Overarching CAC Drivers

There is no set of overarching theories that have been developed to explain adversarial CAC arms control in all their variety in contrast, for example, to the extensive body of scholarship that has attempted to explain war (with many theories) or more generally the literature which attempts to explain relationships between states. As discussed in greater detail in Chapter 3, Cold War CAC literature focused on NATO-Warsaw Pact relations and CAC theory explained that the two blocs viewed CAC as preventing surprise attacks and/or reducing the likelihood of either side waging a successful conventional war for fear that any such war would escalate into a full-scale nuclear war.[133]

Nuclear war and nuclear weapons arms control could be explained by two broad theories: first-strike stability and mutually assured destruction (MAD). These intertwined theories stated that the purpose of arms control was to reduce the number of warheads while

[133] "Trends and Developments in Warsaw Pact Theater Forces and Doctrine Through the 1990s," National Intelligence Estimate (Virginia: Director Central Intelligence, February 1989).

ensuring that no side could launch a devastating first strike that would incapacitate the other side's ability to respond with a devastating retaliation. If both sides were able to counter-attack, especially against population centers, then neither side would initiate a nuclear war.[134]

There may be several reasons why scholars have not attempted to offer theories to explain CAC. First, it is unclear what aspect of CAC can or should be theorized. While nuclear arms control theories carry through well across all three stages of arms control, this may not be the case for CAC. What might explain why states enter into a CAC agreement does not necessarily explain what is negotiated nor how it is implemented. Moreover, nuclear arms control agreements are, in essence, limited to the number of warheads and, to a much lesser extent, defenses against warheads.

In contrast, CAC agreements (at least in this dissertation's datasets) are much broader than NATO-Warsaw Pact or US-Soviet Union/Russia arms control agreements. This dissertation's datasets include agreements that are in some ways comparable to nuclear arms control agreements, such as the CFE Treaty or Anglo-German Naval Agreement, but demilitarization agreements for islands, ceasefires, peace agreements, and straits agreements all differ substantially from those meant to address superpower rivalries.

This dissertation offers several theories or theory sets to explain some aspects of CAC. First, chapter 4 discusses the notion that states – especially the more powerful one that has the most leverage in an agreement's details – seek to retain the status quo in a CAC agreement except in certain conditions. This theory is then tested empirically by assessing whether the predicted outcome of retaining or altering the status quo was borne out by the agreements.

However, three concepts in international security also apply – to varying extents – to CAC agreements despite their variety. These are deterrence, the security dilemma, and the offense-defense balance.[135]

Deterrence can figure in how states conceive of CAC agreements because states that possess deterrence are unlikely to surrender it in any CAC agreement. In certain situations – for example a peace agreement following a major victory – only the winning side concerns itself with preserving deterrence as the losing side has presumably lost it, at least in the near term. But in other agreements, including ceasefires, geographic demilitarization, and peacetime balancing agreements, states may seek to retain their deterrence and even seek to permit an

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[134] John H. Maurer, "Arms Control and the Anglo-German Naval Race before World War I: Lessons for Today?," *Political Science Quarterly* 112, no. 2 (1997): 285, https://doi.org/10.2307/2657942.
[135] Some of the following text is based on material written for an unpublished article co-authored with Joachim Koops and Jordan Becker.

increase in their adversary's deterrence. In this case, the security dilemma is mitigated. Lastly, and emerging from the security dilemma, the offense-defense balance (ODB) is a critical element in both international relations (IR) theory and CAC – identifying which weapons to control and how depends on mutually agreed understandings of their purpose, which are notoriously elusive. Table 4 notes to which agreements the three concepts apply.

Table 4: Applicability of deterrence, the security dilemma, and offense-defense balance to each agreement

Short Name	**Deterrence**	**Security Dilemma**	**ODB**
Germany1919	Y	N	Y
Austria1919	Y	N	Y
Hungary1920	Y	N	Y
Bulgaria1919	Y	N	Y
Spitsbergen	Y	Y	N
Tartu	Y	N	Y
Åland	Y	Y	N
WashNav	Y	Y	Y
Helsinki1922	Y	Y	N
Tangiers	Y	Y	N
Aegean	Y	Y	N
Thrace	Y	Y	N
Lausanne	Y	Y	Y
LondonNav1930	Y	Y	Y
LondonNav1936	Y	Y	Y
Anglo-German	Y	Y	N
Montreux	Y	Y	Y
Moscow1940	Y	N	Y
Germany1945	Y	N	Y
Finland1947	Y	N	Y
Romania1947	Y	N	Y
Italy1947	Y	N	Y
Bulgaria1947	Y	N	Y
Dodecanese1947	Y	Y	N
Hungary1947	Y	N	Y
Austria1955	Y	N	Y
WEU	N	N	N

Short Name	**Deterrence**	**Security Dilemma**	**ODB**
Cyprus	Y	Y	N
INF	Y	Y	Y
Germany	Y	Y	Y
CFE	Y	Y	Y
Transdnistria	Y	Y	N
Balkans	Y	Y	Y
Belfast	N	Y	N
Kosovo	Y	N	N
Georgia	Y	Y	N
Minsk	Y	Y	Y

Source: Author's research and analysis

Deterrence

Modern deterrence theory builds on classical theories of deterrence[136] wherein "punishment is severe, certain and swift, a rational individual will weigh potential gains and losses before engaging in illegal activity and will be discouraged from breaking the law if the loss is greater than the gain."[137]

Modern deterrence theory emerged during the Cold War, which applied classical theories of deterrence of illegal activity to conflict between nuclear-armed powers.[138] While efforts at deterrence can create a security dilemma, they may also mitigate security dilemmas.[139] Glaser, for example, argues that the "deterrence model... applies to secure greedy states and therefore rejects the security dilemma."[140] A state's deterrence strategy may attempt to escape

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[136] Thomas Hobbes, "4. Leviathan," in *Democracy* (Columbia University Press, 2016), 37–42; Jeremy Bentham, "An Introduction to the Principles of Morals and Legislation," *History of Economic Thought Books*, 1781.
[137] Juste Abramovaite et al., "Classical Deterrence Theory Revisited: An Empirical Analysis of Police Force Areas in England and Wales," *European Journal of Criminology*, January 10, 2022, 2, https://doi.org/10.1177/14773708211072415.
[138] Thomas C. Schelling, *Arms and Influence* (Yale University Press, 1966), https://www.jstor.org/stable/j.ctt5vm52s.
[139] Jervis, "Cooperation Under the Security Dilemma"; Dan Reiter, "Exploring the Bargaining Model of War," *Perspectives on Politics* 1, no. 1 (March 2003): 27–43, https://doi.org/10.1017/S1537592703000033.
[140] Charles L. Glaser, "The Security Dilemma Revisited," *World Politics* 50, no. 1 (October 1997): 174, https://doi.org/10.1017/S0043887100014763.

the security dilemma through a defensive orientation at the lowest force level possible, or it may deter through superior strength.[141]

Deterrence can also incorporate diplomatic, economic, political, and other elements. Mazarr et al. identify two types of deterrence: *denial* (denying an attacker's capability to seize their military objectives); and *punishment* (the ability to sufficiently punish an attacker so that the costs of attacking are much higher than the benefits).[142] Haffa complements these with deterrence depending on capability, credibility, and communication, which again have some overlap with the security dilemma but where decision-making has a greater role.[143] Danilovic[144] and Driver[145] distinguish between direct and extended deterrence, with direct referring to the deterrence from a directly threatened state and extended referring to deterring on behalf of other states. Extended deterrence is important because NATO's foundation of collective defense is based on deterrence extended from the US to its European allies.[146] The crucial policy challenge for extended deterrence is credibly communicating a state offering extended deterrence is willing and able to respond in the same way to an attack on its allies in the same way it would to an attack on its own territory.[147]

One way in which deterrence differs from the security dilemma is that "deterrence by punishment' may hinge on national or alliance willpower. An adversary will only be deterred if they believe that the target of an attack has the will to impose high, punishing costs that may require significant losses of lives, expenditures, and destruction on the part of the target.[148]

CAC and deterrence are closely related because adversaries are generally unwilling to reduce or even sacrifice deterrence for CAC (except in cases of a punitive peace agreement where the losing side has no choice). They would only do so if they see (or would like to see) that the relationship is moving from adversarial to cooperative, such as in the last years of the

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141 NATO, "NATO's Role in Conventional Arms Control," NATO, April 11, 2023, https://www.nato.int/cps/en/natohq/topics_48896.htm; NATO, "Arms Control, Disarmament and Non-Proliferation in NATO," NATO, February 27, 2023, https://www.nato.int/cps/en/natohq/topics_48895.htm.
142 Michael Mazarr, Arthur Chan, et al., *What Deters and Why: Exploring Requirements for Effective Deterrence of Interstate Aggression* (RAND Corporation, 2018), https://doi.org/10.7249/RR2451.At the same time, it is unclear whether, from the USSR's perspective, the unilateral reductions reduced deterrence.
143 Haffa, "The Future of Conventional Deterrence."
144 Vesna Danilovic, "The Sources of Threat Credibility in Extended Deterrence," *Journal of Conflict Resolution* 45, no. 3 (June 1, 2001): 341–69, https://doi.org/10.1177/0022002701045003005.
145 Driver, "Deterrence in Eastern Europe in Theory and Practice."
146 A simple example is that the US deters attacks against its territory by its ability to overwhelming respond with conventional or nuclear forces, and a willingness to use them. NATO members in Europe enjoy protection against an attack through the US's extended deterrence. That is, even if the US or its forces are not the subject of an attack, it has committed to protecting its allies.
147 Paul K. Huth, "Extended Deterrence and the Outbreak of War," *American Political Science Review* 82, no. 2 (June 1988): 423–43, https://doi.org/10.2307/1957394.
148 Justin Magula, Michael Rouland, and Peter Zwack, "NATO and Russia: Defense and Deterrence in a Time of Conflict," *Defence Studies* 22, no. 3 (July 3, 2022): 502–9, https://doi.org/10.1080/14702436.2022.2082957.

Cold War when Gorbachev initiated unilateral troop reductions in Eastern Europe and then when the CFE Treaty was signed.[149] Thus, states negotiating a balanced CAC need to determine their own deterrence needs while reassuring counterparts that they also appreciate their deterrence needs.[150]

This situation poses two challenges – first, identifying when deterrence is maintained or not; and second, for signatories to agree on one another's force structure required for deterrence, especially as states are more likely to view their own needs as greater than what adversaries believe an opposing state or bloc should have, because they tend to view their own intentions as benign while viewing adversaries as aggressive.[151] Thus, even when states agree in principle on the need for mutual deterrence, they may not agree on the specific force structure that each side needs for deterrence.[152] This was an issue during the 15 years of the NATO-Warsaw Treaty Organization (WTO, or Warsaw Pact) MBFR negotiations which transitioned into the CFE negotiations.[153] Ultimately, the CFE Treaty resulted in substantial conventional force reductions and limits while still, both sides believed for a time, retaining mutual deterrence. Moreover, while assessment of the net military balance is important to deterrence perceptions and arms control negotiations and agreements (as was the case with NATO's goal of pursuing equal force levels with the WTO during the MBFR negotiations), deterrence also incorporates other considerations such as alliances, diplomacy, and domestic politics and support.[154]

Buffer zones which may accompany cease-fire agreements increase mutual deterrence because states may be less able to conduct a successful attack as buffer zones offer increased warning and response times, and the presence of international peacekeeping forces can slow down attacks. The cost of conducting an attack also increases (contributing to deterrence)

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149 Wilcox, *The Treaty on Conventional Armed Forces in Europe and Russian Foreign and Security Policy (Dissertation)*. Another example of deterrence losing relevance can are when adversaries become allies, as discussed in Kupchan *How Enemies Become Friends: The Sources of Stable Peace*, Princeton Studies in International History and Politics (Princeton: Princeton University Press, 2010).

150 Robert Jervis, "Arms Control, Stability, and Causes of War," *Political Science Quarterly* 108, no. 2 (1993): 239–53, https://doi.org/10.2307/2152010.

151 Leonie Huddy, David O. Sears, and Jack S. Levy, "Introduction: Theoretical Foundations of Political Psychology," in *The Oxford Handbook of Political Psychology*, ed. Leonie Huddy, David O. Sears, and Jack S. Levy (Oxford University Press, 2013), 0, https://doi.org/10.1093/oxfordhb/9780199760107.013.0001; Janice Gross Stein, "Threat Perception in International Relations," in *The Oxford Handbook of Political Psychology*, ed. Leonie Huddy, David O. Sears, and Jack S. Levy (Oxford University Press, 2013), 0, https://doi.org/10.1093/oxfordhb/9780199760107.013.0012.

152 Thomas Müller and Mathias Albert, "Whose Balance? A Constructivist Approach to Balance of Power Politics," *European Journal of International Security* 6, no. 1 (February 2021): 109–28, https://doi.org/10.1017/eis.2020.19.

153 Müller and Albert.

154 Mearsheimer, *Conventional Deterrence*.

because attackers risk diplomatic and military responses from cease-fire guarantors and peacekeeping forces (and their originating states) if they strike into and through the demilitarized buffer areas.

In short, for certain types of agreements CAC leans on a deterrence model of mitigating the security dilemma in the sense that when treaties limit, rather than eliminate adversaries' arsenals, they preserve deterrent capabilities by design. The art of effective CAC, in fact, is to reduce the total amount of armaments among its signatories while preserving each of their ability to secure their fundamental interests by deterring the others from taking actions that would undermine them[155] – what NATO consistently referred to as "the lowest possible level of armaments."[156]

Security Dilemma

States are conscious that, if their adversaries have a reasonable choice of entering into a CAC agreement (i.e. they are not a vanquished foe), they will seek to retain their deterrence. Thus, any non-discriminatory CAC agreement should mitigate the security dilemma. States adopt strategies like alliance building,[157] developing and maintaining positive relations with neighbors and potential adversaries,[158] and maintaining a military capable of deterring and resisting an attack.[159] However, such balancing behavior can create a security dilemma wherein a suitable defense can appear (or be) threatening to an adversary. The adversary may, in response to a state's military capabilities, build a counter-alliance, build up their own military, or even attack to disarm the opposing state or out of fear that the opposing state is going to attack first.[160] Taliaferro argues that the security dilemma is an "intractable feature of anarchy."[161] Uncertainty about other states' intentions compels states to err on the side of

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[155] R. Rajaraman et al., *Global Nuclear Security: Moving beyond the NSS*, ed. Rajeswari P. Rajagopalan and Allard Wagemaker, GP-ORF Series (New Delhi: Observer Research Foundation, 2018).
[156] NATO, "Conventional Arms Control: The Way Ahead," NATO, May 2, 1988, http://www.nato.int/cps/en/natohq/official_texts_23453.htm.
[157] Glenn H. Snyder, "The Security Dilemma in Alliance Politics," *World Politics* 36, no. 4 (July 1984): 461–95, https://doi.org/10.2307/2010183.
[158] Thomas J. Christensen, "China, the U.S.-Japan Alliance, and the Security Dilemma in East Asia," *International Security* 23, no. 4 (1999): 49–80.
[159] William C. Wohlforth et al., "Testing Balance-of-Power Theory in World History," *European Journal of International Relations* 13, no. 2 (June 2007): 155–85, https://doi.org/10.1177/1354066107076951.
[160] Jervis, "Cooperation Under the Security Dilemma"; Wolfgang Zellner, "Addressing the Threat of Uncontrolled Escalation by Means of Conventional Arms Control in Europe," *Security and Human Rights* 30 (2020): 100–107, https://doi.org/10.1163/18750230-03001002.
[161] Jeffrey W. Taliaferro, "Security Seeking under Anarchy: Defensive Realism Revisited," *International Security* 25, no. 3 (January 2001): 131, https://doi.org/10.1162/016228800560543.

aggression.[162] Some analysts argued, for example, that the security dilemma may have contributed to the outbreak of the Russo-Ukraine War, as President Putin may have interpreted growing NATO capabilities in the Baltics as threatening.[163] Perceptions play a key role in creating and mitigating the security dilemma not the least because states tend to view themselves as defensive and others as potentially offensive.[164]

CAC agreements that arise from a ceasefire and establish a buffer zone, often with an international peacekeeping force, mitigate the security dilemma because any side that engages in threatening behavior risks high diplomatic costs and even clashes with the international peacekeeping forces. Thus, each side is discouraged from engaging in threatening behavior and defensive behavior is more likely to be perceived as less threatening because each side believes that the other will not risk the costs of aggression against or clashes with the international peacekeeping force.

CAC is an established means to manage the security dilemma both by limiting military capabilities and by exchanging information and even CSBMs to create conditions for future cooperation.[165] Alternatively, a state may decide that a robust deterrence strategy is more important than maintaining a stable relationship or they may attempt to unilaterally resolve their potential adversaries' security dilemma by having a defense-oriented military posture lacking offensive capability, consistent with ODB theory. The security dilemma is a core building block for CAC theory because CAC agreements often aim to mitigate security dilemmas in conflict and peacetime.

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[162] Montgomery, "Breaking Out of the Security Dilemma: Realism, Reassurance, and the Problem of Uncertainty."
[163] Vladimir Isachenkov, "Putin Demands NATO Guarantees Not to Expand Eastward," Military Times, December 1, 2021, https://www.militarytimes.com/flashpoints/2021/12/01/putin-demands-nato-guarantees-not-to-expand-eastward/; John J. Mearsheimer, "Why the Ukraine Crisis Is the West's Fault: The Liberal Delusions That Provoked Putin," *Foreign Aff.* 93 (2014): 77; Michael McFaul, Stephen Sestanovich, and John J. Mearsheimer, "Faulty Powers: Who Started the Ukraine Crisis?," *Foreign Affairs* 93, no. 6 (2014): 167–78; Alberto Priego, "NATO Enlargement: A Security Dilemma for Russia?," in *Routledge Handbook of Russian Security* (Routledge, 2019); Joshua R. Itzkowitz Shifrinson, "Eastbound and down: The United States, NATO Enlargement, and Suppressing the Soviet and Western European Alternatives, 1990–1992," *Journal of Strategic Studies* 43, no. 6–7 (November 9, 2020): 816–46, https://doi.org/10.1080/01402390.2020.1737931.
[164] Wolfgang Zellner, Olga Oliker, and Steven Pifer, "A Little of the Old, a Little of the New: A Fresh Approach to Conventional Arms Control in Europe," Deep Cuts Issue Brief (Hamburg, Germany: Institut für Friedensforschung und Sicher- heitspolitik an der Universität Hamburg (IFSH), September 2020).
[165] Jervis, "Cooperation Under the Security Dilemma," 177. Jervis uses the prisoner's dilemma game to demonstrate how cooperation can bring mutually beneficial gains while ameliorating the security dilemma. The OSCE Final Act, which is the most extensive set of CSBMs in Europe, maintains that CSBMs can "contribute to reducing the dangers of armed conflict and of misunderstanding or miscalculation of military activities which could give rise to apprehension, particularly in a situation where the participating States lack clear and timely information about the nature of such activities" OSCE, "Conference On Security And Co-Operation In Europe Final Act (Helsinki Final Act)," August 1, 1975, 10.

Offense-Defense Balance

The final theoretical element that sheds light on the emergence and persistence of CAC agreements is the offense-defense balance (ODB), which is discussed and explained by ODB theory. ODB theory suggests that CAC agreements will incorporate limits on specific weapon systems that are perceived as having more of an offensive than defensive capability, and that all agreements will take into account the ODB to preserve deterrence and, when applicable, mitigate the security dilemma. The ODB literature is extensive, with debate consisting of the definition(s), existence, importance, and application of ODB.[166] In some definitions, ODB can be determined by technology,[167] in others by types of equipment, and in yet others by force employment.[168] Jervis assesses the ODB on the cost for an attacker versus a defender to win a battle or war.[169] Alongside these theoretical considerations, arms controllers must also consider particulars like geography, force size, and force quality.

The CFE Treaty itself addressed state insecurities theorized by ODB work in attempting to limit weapons for each side that were considered "offensive" and enabling a successful surprise attack. At the same time, the CFE Treaty did not limit a wide range of weapons that might have been considered more defensive in nature, such as landmines, air defense weapons, and fortifications. CAC agreements demonstrate that not all military capabilities can be limited, and that to preserve deterrence and resolve the security dilemma, some military capabilities matter more than others – systems signatories consider more offensive than defensive often matter more for CAC.

ODB theory is central to a clear understanding of CAC because, as Zellner [170] and others emphasize, a perceived, mutual offensive advantage increases the risk of conflict because states may be confronted with the choice of either attacking and winning, or being attacked and losing. Moreover, shifts in ODB can lead to disruption in existing CAC arrangements or, potentially, to new CAC arrangements.

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[166] Karen Adams, "Attack and Conquer? International Anarchy and the Offense-Defense-Deterrence Balance," *International Security* 28, no. 3 (Winter /2004 2003): 45–83, https://doi.org/10.1162/016228803773100075; James W. Davis et al., "Taking Offense at Offense-Defense Theory," *International Security* 23, no. 3 (Winter, -1999 1998): 179, https://doi.org/10.2307/2539342; Charles L Glaser and Chaim Kaufmann, "What Is the Offense-Defense Balance and Can We Measure It?," *International Security* 22, no. 4 (Spring 1998): 23; Lynn-Jones, "Offense-Defense Theory and Its Critics."

[167] Levy, "The Offensive/Defensive Balance of Military Technology."

[168] Biddle, "Rebuilding the Foundations of Offense-Defense Theory"; Goldfischer, "1. The Meaning of Offense and Defense."

[169] Jervis, "Cooperation Under the Security Dilemma."

[170] Zellner, Oliker, and Pifer, "A Little of the Old, a Little of the New: A Fresh Approach to Conventional Arms Control in Europe."

The ODB may not apply to certain CAC agreements. Demilitarization agreements often create a broad restriction on any kind of military capability, thus whether the capability is offensive or defensive is not relevant.

Methodology

Sources

In addition to the sources of information that have been discussed in the previous chapters, this section provides details about how the sources used in this thesis fall into three general categories: legal treaty documents and agreements, primary sources from agreement executors, and secondary sources from government agencies, academia, news sources, databases, reference materials, and other sources.

Official treaty text for each agreement discussed in this thesis is, generally, easily available from government websites, international organization sites, reports from international organizations, or academic libraries. The official treaty texts can provide information about the legally agreed, official reasons for treaties, when applicable the specific quantitative limitations and any relevant geographic restrictions, conditions and methods of implementation, and (when agreed by the signatories) the creation of or assignment of implementation to agreement executors.

The agreements may be supplemented by additional protocols and amendments, defining or redefining weapon systems, laying out more specific procedures for implementation, or adding new members. The treaties rarely reflect disputes that occurred during negotiation, nor do they often specify precisely how a certain TLE quantity was arrived at. Moreover, they do not mention proposals that were not accepted.

When agreement executors are created, many of them make reports public, or their reports have become public over the course of time. For example, many of the post-World War One Allied military commissions' reports are available through the UN archives. These reports provided information including the commissions' functions, staff, organization, and challenges. The reports include compliance assessments and detailed inspection reports. Only a selection of reports are available from the UN archives.

Other examples of agreement executor reports that were consulted for this thesis include regular assessments issued by the commissions created in Northern Ireland to implement the 1998 Belfast Agreement, the EUMM in Georgia, and OSCE SMM in Ukraine which issued publicly available newsletters and periodic reports. These three bodies also maintained web pages that provided additional information, either independently in the case of the commissions in Northern Ireland or part of the webspace hosted by their home organizations in the case of the EUMM and SMM.

Government agencies issued statements, transcripts of speeches, decisions, and other information relevant to this thesis. For example, the Russian government has issued various strategy and policy documents that explain the government's goals, priorities, and disputes with other states. These often provide Moscow's view of CAC at the time of publication. The US government has issued periodic reports about CFE Treaty compliance, which provides insights into how the US government views the treaty and also offers specific details about the extent to which states are compliant. The US government more than others also conducted and published CAC-related studies, including by the US Congress's Congressional Budget Office (CBO) and Congressional Research Service (CRS). These have assessed options, costs, and other issues relevant to CAC.

Think tanks and similar organizations, such as US-based RAND, UK-based RUSI, and Sweden's FOI publish extensive research reports on a range of arms control, military, and security issues and policies. These have varying connections to national governments through funding and partnerships, but the reports are not official findings or statements of the sponsoring governments. These reports are of great use in providing a level of detail and length, as well as tackling practical policy issues, that other sources are less able to cover.

Academic and professional journals were an important source of insights and information, especially in the areas of theory. Journal articles offer a focused argument or set of arguments on relevant topics, usually based on historical and secondary information. Some articles conducted quantitative studies, which were also useful to provide additional insights especially when going beyond a current issue or case study.

Several reference sources offered information about defense spending, the composition of national militaries, and other information. The Correlate of War project offers a database of national military capability for all countries going back to 1816.[171] This database offers calculations of national defense budgets, the size of militaries in terms of personnel, and a generalized calculated military capability score. Their use of a universal methodology permits comparisons between countries and over time. The World Bank offers an online database of

[171] J. Michael Greig and Andrew J. Enterline, "Correlates of War Database, National Material Capabilities (v6.0)" (Department of Political Science: University of North Texas, June 2021).

military expenditures and personnel quantity going back to 1992, with expenditure data available as a gross figure, gross domestic product (GDP) percentage, and percentage of government expenditure.[172]

For more specific information about military capabilities and equipment inventories, two reference sources proved to be invaluable. The League of Nation's Disarmament Yearbook for the years 1924-1940 provided detailed information about states' militaries, including the number of ships and total tonnage possessed by each nation. The International Institute for Strategic Studies (IISS) Military Balance annual reference books provided more recent order of battle information.

Lastly, news articles, websites, blogs, and other current events-oriented material provided important information and analysis about a range of topics, including the Russo-Ukraine War, information about CAC agreement implementation, and military developments and trends.

Some of the academic articles and books, including dissertations, included lists of arms control agreements used in their studies. These lists were consulted for this thesis to ensure that all relevant agreements were included.

Reliability and Validity

This dissertation consulted a large and varied body of literature. Ideally, resources that were valid and reliable were used while those that were not were excluded. However, assessing validity and reliability is a necessary part of research, but how and when to do it is context dependent.

First, wholly primary sources such as government statements or legal texts are considered valid and reliable, at least from the perspective that the wording as quoted is what is quoted. For example, any given language in an agreement is undoubtedly that specific language. Similarly, a quote from a senior government official or a report is taken to be an authoritative quote in the sense that the statement is an official statement. This makes such resources valid. However, to the extent to which there are any subjective judgments within the language, further resources and corroboration were required to ascertain reliability and accuracy.

[172] "World Bank Open Data," World Bank Open Data, accessed July 23, 2024, https://data.worldbank.org.

Many primary sources could not be easily verified. For example, reports by the inter-allied commissions of control made by the commissions themselves – which were important when assessing agreement success and delegation (chapter 5) – were assumed to be accurate, in the absence of contradictory information.

For any given secondary source, an assessment was made of the publication and, when applicable, the author. Certain reference sources are generally considered authoritative, such as the Correlates of War database. Insights from peer-reviewed journals and books from established and reputable publishers were generally considered valid and reliable, barring contradictory information in other sources.

When there was conflicting information or interpretations – such as whether or not Russia had violated the INF Treaty (relevant to chapters 5 and 6) – a careful assessment was made based on the available information and arguments. For some questions, information and interpretation provided by an expert in response to a direct inquiry were the only information source. The reliability was based on the individual's or institution's expertise in the topic area, and validity was generally assumed to be valid unless there was a clear bias or there was contradictory information (even if indirect).

This dissertation has attempted to hedge against questions of reliability and validity by generously citing all references, both within the main text and in the appendices.

Notable Information Gaps

Not all the information that might have been useful for this thesis was available, although sufficient information was available to both reach the general conclusions and provide, where necessary, information for quantitative coding for chapters 4-6. However, a tradeoff was made between breadth and depth, and as a result for many agreements only a cursory amount of information was obtained. For example, there was little information about how the Allied Control Commissions functioned. Only brief summaries of some of their activities, decisions, and structure were available. Similarly, little information on the Western European Union's (WEU's) Agency for the Control of Armaments (ACA) was available, with only a few speeches, studies, and references in official NATO documentation available.

This thesis' source material is almost entirely in English, possibly reflecting that most source material – especially secondary – concerning CAC is in English, especially in academic journals. This author diligently went through citations and bibliographies, but other than the occasional Russian source, most cited sources among the works consulted were in English.

This raises the question of whether sufficient account is made for Soviet/Russian perspectives on CAC. The available information that was consulted and researched for this dissertation provides sufficient information on the Russian perspective of the research questions being asked for this thesis' findings and conclusions to be valid. First, most of the research questions are not dependent on Russian (or other state's) individual perspectives – although chapter 4 required extensive research and some estimation of states' perceptions of the global order, military balance stability, and status quo. This includes assessing CAC agreement delegation (chapter 5) and CAC agreement success conditions (chapter 6). Where Russia, or other states' opinions, are necessary, this has often been available from public statements, official documents, or studies others have done on Russian language information and literature.

The two chapters in which Russia's perspective is particularly important is chapter 7 about the link between CAC and Russia's decision to invade Ukraine. This thesis is unlikely alone in painting a picture with an incomplete palette. The question of why Putin invaded Ukraine, and why he invaded when he did, are likely to linger for many years. Chapter 7 attempts to lay out a strong case based largely on Putin's own words, whether in speeches or strategy documents – but unavailable documents and other information held by the Kremlin and other Russian government offices might shed new light on the invasion's motivations were they to become available.

For some agreements, debates leading up to their creation, and their implementation, there was little information other than their legal text and minimal discussions about them in a few books and articles. In the cases of, for example, the Thracian border agreements and the WEU's ADA to ensure that Germany did not exceed NATO-authorized military capabilities, the lack of information may be due in part to the lack of disputes over the agreement. Other agreements similarly did not have a substantial amount of readily available information, such as the Turkish Straits conventions. For these cases, the analyses and narratives available, however, were sufficient to determine the variables for the quantitative coding in chapters 4-6. Additional information could shed additional light on these agreements and their background and might alter some of the quantitative coding in the sum score and QCA chapters.

Research Methodologies

This article-based thesis applies a different methodology for each main research study chapter, summarized below in Table 5 and elaborated within each article-chapter. However, due to length constraints, the methodological discussions were somewhat abbreviated. The following sub-sections offer more discussion about the methodologies used in each chapter.

Table 5: Summary of chapter methodologies

Chapter	**Title**	**Methodology**
4	*Status Quo Constancy and Conventional Arms Control*	Theory development and typological analysis
5	*Delegation to Treaty Bodies and International Organizations for Conventional Arms Control Agreements in Europe: A Sum Score Evaluation*	Sum-score correlational
6	*Conventional Arms Control Agreements in Europe: Conditions of Success and Failure*	QCA
7	*How Conventional Arms Control Failures Caused the Russo-Ukraine War*	Case study, process tracing, and counterfactual

Chapter 4: Status Quo Constancy and Conventional Arms Control

In order to answer the question: *Under what conditions do the more powerful states in an adversarial conventional arms control (CAC) agreement accept a reduction in their relative military power?* Chapter 4 applies a typological methodology to categorize three conditions (variables) that states face when considering entering into a CAC agreement: (1) perception of geopolitical stability, (2), an unstable military balance, and (3) significant resource constraints. This methodology is ideal because the three conditions and outcome do not necessarily scale well along a continuum, and thus a binary data scoring is ideal; and this methodology lends itself to comparing predictions with actual outcomes, which a QCA approach would not do. Lastly, the typological approach is taken because of a lack of existing theory or data on the issue of status quo change with CAC agreements.

This chapter identifies three conditions to assess under what conditions states (usually the more powerful one) will retain or alter the military status quo in a CAC agreement. This study's hypothesis is based on how states would conduct a cost-benefit analysis (CBA) of these factors to predict how combinations of these three conditions would result in retaining or changing the status quo, and then the hypothesis was tested with a typological analysis. The study incorporates a truth table to visualize and best understand the combinations and their outcomes. The three conditions and the outcome of retention or change of the status quo apply a typological approach and predict the pathways (combinations) of the three conditions that will result in a certain outcome, and then compare the actual outcomes with the predicted outcomes.[173]

Typological approaches to social science research are common[174] even if they do not overtly acknowledge the development and application of typologies. Typological theorizing has many advantages for case study research, especially in international relations, where complex phenomena are common,[175] and comparative historical analysis,[176] which characterizes this chapter (and indeed much of this dissertation) as it extensively studies and compares the history of CAC agreements and constructs independent and dependent variables in part through process tracing. Typologizing research is often important to "bring a little order to the chaos of the data."[177] Typological approaches to social sciences are especially relevant and applicable when the phenomenon being studied, such as policies, do not present immediately apparent quantitative and empirical qualities.[178]

Typologies are in more colloquial language the process and establishment of categories or classification. Smith proposes that there are two approaches to classification: typology and taxonomy.[179] In his view, the difference is (and there is likely any number of areas which might fall somewhere in between) that typology is more reflective of social sciences wherein the classification is subjective; that is, it is not based on strict, observable or measurable traits, but

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173 Andrew. Bennett, "Case Study: Methods and Analysis," in *International Encyclopedia of the Social & Behavioral Sciences* (Elsevier, 2015), 208–13, https://doi.org/10.1016/B978-0-08-097086-8.44003-1.
174 Jørgen Møller and Svend-Erik Skaaning, "Explanatory Typologies as a Nested Strategy of Inquiry: Combining Cross-Case and Within-Case Analyses," *Sociological Methods & Research* 46, no. 4 (November 2017): 1018–48, https://doi.org/10.1177/0049124115613778; Kevin B. Smith, "Typologies, Taxonomies, and the Benefits of Policy Classification," *Policy Studies Journal,* 30, no. 3 (2002): 379–95.
175 Andrew Bennett and Colin Elman, "Case Study Methods in the International Relations Subfield," *Comparative Political Studies* 40, no. 2 (February 2007): 170–95, https://doi.org/10.1177/0010414006296346.
176 James Mahoney, "Comparative-Historical Methodology," *Annual Review of Sociology* 30, no. 1 (August 1, 2004): 81–101, https://doi.org/10.1146/annurev.soc.30.012703.110507.
177 Jo Reichertz, "Abduction: The Logic of Discovery of Grounded Theory," *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research* 11 (January 1, 2007): sec. 2, https://doi.org/10.4135/9781848607941.n10.
178 Smith, "Typologies, Taxonomies, and the Benefits of Policy Classification."
179 Smith, 381–82.

rather reflect concepts. They "create useful heuristics and provide a systematic basis for comparison."[180] Taxonomy, in contrast, is based on more empirically observable and measurable characteristics and reflects scholarship and work more typical in the hard sciences such as physics and biology.[181] An electron is easy to define because of its distinct characteristics (mass and charge, for example); few scientists are likely to suggest that something is "partially" an electron. This is not to say that physical and biological scientists do not debate any number of taxonomical issues – undoubtedly much of their taxonomical labels are the product of debate and research.[182] However, once a definition is settled, the definition is much less subject to interpretation and flexible conceptualization *in comparison* to social science. Bennett and Elman make a similar distinction between different approaches of classification, though they refer to what Smith calls typology as explanatory typology (which is most relevant to social science theory building) and contrast it with "simple descriptive and classification typologies".[183]

Social science typologies are conceptual for the simple reason that any given study or user adjusts the typology of the phenomenon based on their research question, data, and hypotheses. The definition of war, for example, changes based on what the studies' focus is as well as the authors' preferences and conceptualization.[184] Arms control is the subject of many typologies, whether based on the type of weapon (conventional vs. nuclear); or its motivations and objectives.[185] Major studies of arms control, such as this dissertation, engage in a typological exercise initially when decisions are made to decide which agreements to include or not. Tanner, for example, "establishes a typology of war outcomes in function of their effects on arms control."[186] Kühn discusses several typologies for his study on arms control in Europe, including CAC agreement regimes and in his necessary selection and exclusion of which arms control agreements are relevant to his study.[187] Croft proposes five typologies of arms control, based on a combination of their origin, purpose, and function.[188]

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180 Smith, 381.
181 Smith, 381–82.
182 One might recall the debate about whether or not Pluto is a planet. It was downgraded to dwarf planet, but not because of any change in its characteristics, but astronomers shifting definition of a planet.
183 Bennett and Elman, "Case Study Methods in the International Relations Subfield," 181.
184 "Challenges and Threats to Security in Latin America" (Peru: Centro De Estudios Estratégicos Del Ejército Del Perú, November 2022); Mazarr, Chan, et al., *What Deters and Why*; Meredith Reid Sarkees, "The COW Typology of War: Defining and Categorizing Wars (Version 4 of the Data)" (Correlates of War, n.d.), https://correlatesofwar.org/wp-content/uploads/COW-Website-Typology-of-war.pdf.
185 Morgan, "Arms Control: A Theoretical Perspective."
186 Tanner, "Postwar Arms Control."
187 Kühn, *The Rise and Fall of Cooperative Arms Control in Europe*, 2020.
188 Stuart Croft, "In Defence of Arms Control," *Political Studies* 44, no. 5 (December 1996): 888–905, https://doi.org/10.1111/j.1467-9248.1996.tb00340.x.

This study's typological approach is driven by the creation of multiple variables under consideration,[189] with each variable and the outcome having similarities with set theory.[190] In this study, each condition is binary so that each agreement is within or outside of the set (condition). Similarly, each agreement falls in or outside of the outcome, status quo retention.

Although chapter 4 has some similarities to QCA in that it is characterized by conditions and outcomes – and its binary approach of yes/no for the conditions would be fitting for crisp set QCA (csQCA) – this is not a QCA study for two reasons. First, the chapter does not analyze the cases from the perspective of set theory despite similarities. QCA typically calculates to what extent cases fit in the conditions, conditional combinations, and outcomes. Second, the focus is not on determining what the pathways are for the outcomes, but on whether the actual outcomes matched the predicted outcomes.

This chapter, as well as chapters 5 and 6, as a comparative historical study, has attempted to effectively rise "to the challenge of dealing with the tension between cross-case and within-case considerations by comparing all relevant cases (within certain scope conditions) on the macro-level using explanatory typologies and by subsequently carrying out process tracing in each and every cases. Many scholars working within comparative historical analysis have, on this basis, combined cross-case and within-case analyses to formulate some forceful and impressive theoretical insights."[191]

Chapter 5: Delegation to Treaty Bodies and International Organizations for Conventional Arms Control Agreements in Europe: A Sum Score Evaluation

In order to answer the question: *What is the effect of delegation to an agreement executor, such as an international organization, on the success of CAC in Europe?* This chapter uses a sum score methodology to measure state delegation of authority to agreement implementers and then to analyze this as the independent variable with agreement success (the dependent variable) in a cross-case correlational study. The chapter uses this methodology because, lacking a universal metric to measure delegation to treaty implementers (often IOs), this

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[189] John Gerring, "Case Selection for Case-Study Analysis: Qualitative and Quantitative Techniques," in *The Oxford Handbook of Political Methodology*, ed. Janet M. Box-Steffensmeier, Henry E. Brady, and David Collier, 1st ed. (Oxford University Press, 2009), 645–84, https://doi.org/10.1093/oxfordhb/9780199286546.003.0028.

[190] Carsten Q. Schneider and Claudius Wagemann, *Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis*, 1st ed. (Cambridge University Press, 2012), https://doi.org/10.1017/CBO9781139004244.

[191] Møller and Skaaning, "Explanatory Typologies as a Nested Strategy of Inquiry," 1030.

methodology fits with the need to disaggregate what constituted delegation to a CAC agreement implementer while generating a single figure that quantitatively describes the level of delegation. By establishing real numbers for delegation and success, it was possible to conduct various mathematical calculations. One of chapter 5's main inspirations was Brown's article, "Measuring Delegation," which calculates by summation 10 categories to assess delegation to IGOs.[192]

Chapter 5's sum score methodology basis is that the overall independent variable (delegation) is composed of nine distinct traits. The approach of any sum score method is demonstrated by the following equation:

$$Y = X_1 + X_2 + X_3 + X_4 + X_V$$

Where Y is the total (sum) score, and X_1 through X_V (V being the total number of items) is the individual score for each item.

As discussed in further detail in chapter 5, the sum score methodology was originally conceived and developed as a scientific method in the field of psychology, wherein subjects (in the case of research) or patients (in the case of clinical sessions) were given tests, with the responses to each individual question being given by either the subject/patient or the clinician.[193] Psychology was an initiator of this method because of the need to measure mental states such as depression and anxiety, but for which there was no single, quantitative measurement (compared to body temperature or blood pressure). Psychologists developed methods to assess mental states by a series of questions that could be scored and the scores added up.[194] Some tests could assess different phenomena within the same test.

One of sum scoring's methodological issues concerns scoring sensitivity or insensitivity. Each question or item may be given equal weight as a part of the total (for example, five questions may each have a score of 0 to 3, adding up to a score between 0 and 15). This approach, however, assumes that each item is of equal weight, or as Edelsbrunner stated, "all indicators represent approximately equal shares of the construct."[195] The chapter on

[192] Brown, "Measuring Delegation."
[193] Daniel McNeish and Melissa Gordon Wolf, "Thinking Twice about Sum Scores," *Behavior Research Methods* 52, no. 6 (April 22, 2020): 2287–2305, https://doi.org/10.3758/s13428-020-01398-0.
[194] McNeish and Wolf.
[195] Peter Adriaan Edelsbrunner, "A Model and Its Fit Lie in the Eye of the Beholder: Long Live the Sum Score," *Frontiers in Psychology* 13 (October 13, 2022): 3, https://doi.org/10.3389/fpsyg.2022.986767. See also Keith F. Widaman and William Revelle, "Thinking Thrice about Sum Scores, and Then Some More about Measurement and Analysis," *Behavior Research Methods* 55, no. 2 (April 25, 2022): 788–806, https://doi.org/10.3758/s13428-022-01849-w.

CAC agreement delegation assesses that the nine variables are equal in weight, as discussed in greater detail within the chapter.

An important difference between using sum scoring in this dissertation compared to health sciences is that in chapter 5 the author assigns the scores, while in psychology the scores are more typically the result of a subject's response to questions. However, even in clinical practice, sum-score tests may be filled out by the clinician rather than the patient, with the clinician basing the results on their subjective, experienced judgment or the test guidelines. Two examples of these are the Mini-Mental State Examination (MMSE)[196] and the Folstein Mini-Mental Examination.[197]

A core characteristic of sum-scale scoring is the unidimensionality of the individual questions or categories. If there is an overlap between the individual categories of measurement that form the sum score, the results may lose accuracy and relevance. As Ziegler and Hagemann stated:

> "Unidimensionality of the items comprising a test score is essential for the soundness of the assessment processes the score is being used in…. However, when constructing the items, one can at least try to ensure that the items are not loaded with other traits. Otherwise, constructs with a tightly woven nomological net, that is, many overlapping or closely related other constructs, might be impossible to represent with unidimensional items."[198]

One way to visualize this with a Venn diagram is that each item or variable being tested should exist as its own, separate circle or otherwise minimally intercept. An example of this in international security might be if one was attempting to measure with a sum score approach national power composed of variables including GDP and defense industrial capability (separately). This would not be an ideal division of variables because defense industrial

[196] Lenore Kurlowicz and Meredith Wallace, "The Mini-Mental State Examination (MMSE)," *Journal of Gerontological Nursing* 25, no. 5 (May 1999): 8–9, https://doi.org/10.3928/0098-9134-19990501-08.
[197] M. F. Folstein, S. E. Folstein, and P. R. McHugh, "Folstein Mini Mental Examination" (APA PsycTests, 1975), https://www.wcpc.us/AttyTrain/FolsteinMiniMentalExamination.pdf.
[198] Matthias Ziegler and Dirk Hagemann, "Testing the Unidimensionality of Items: Pitfalls and Loopholes," *European Journal of Psychological Assessment* 31, no. 4 (December 14, 2015): 232, https://doi.org/10.1027/1015-5759/a000309.

capacity may be related to GDP.[199] Chapter 5, for example, does not include IGO involvement as a variable as many of the variables themselves are a manifestation of IGO involvement.

To summarize, there is no theoretical reason why any of the nine variables cannot exist in the absence of others, and indeed the data shows great variation in the variables between cases. One reason why such variation is possible is that states can perform some or all of the functions that serve as the delegation variables.

While the application of psychological tests, psychology research, and the health sciences may seem *prime facie* of limited relevance to international relations studies, the seminal work by Jervis, for example, applies psychology in part to develop his theory of perception and misperception in international relations.[200] Moreover, as McNeish and Wolf note, it is impossible to measure psychological conditions with a ruler.[201] This observation can equally apply to many aspects of international relations, such as deterrence, diplomatic relations, alliance strengths, and in the case of this article, delegation (and its component parts) to CAC treaty implementers.

One example of a study that uses the equivalent of a sum score is Hooghe and Marks' article, "Delegation and Pooling in International Organizations."[202] The authors sum nine variables such as budget drafting and policy initiation to calculate a score for delegation for a maximum of nine points. They also sum four variables to arrive at their assessment of pooling. These two sums are then used to analyze how different types of international organizations and their membership interact. Similarly, Tallberg et al. in *The Opening Up of International Organizations*, assign scores to IOs to assess transnational actor (TNA) access to IOs, and conduct various analytical calculations on their scores such as correlational analysis on an IO's technical complexity, and trend analysis of levels of TNA access over time.[203]

This study's methodology has comparisons to, and may be considered a subset of, a composite index – which itself might be used as independent variables to be tested against

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[199] Michael Beckley, "Economic Development and Military Effectiveness," *Journal of Strategic Studies* 33, no. 1 (February 1, 2010): 43–79, https://doi.org/10.1080/01402391003603581; Luqman Saeed, "The Impact of Military Expenditures on Economic Growth: A New Instrumental Variables Approach," *Defence and Peace Economics*, October 9, 2023, 1–16, https://doi.org/10.1080/10242694.2023.2259651.
[200] Robert Jervis, "War and Misperception," *The Journal of Interdisciplinary History* 18, no. 4 (Spring 1988): 675–700.
[201] McNeish and Wolf, "Thinking Twice about Sum Scores."
[202] Hooghe and Marks, "Delegation and Pooling in International Organizations."
[203] Jonas Tallberg et al., *The Opening Up of International Organizations: Transnational Access in Global Governance*, 1st ed. (Cambridge: Cambridge University Press, 2013), https://doi.org/10.1017/CBO9781107325135.

dependent variables.[204] Composite indices are used in a wide range of areas, and examples within international relations include transparency,[205] global financial analysis,[206] corruption ratings,[207] military force assessment,[208] and public attitudes about democracy.[209] The Correlates of War (CoW) Composite Indicator of National Capability (CINC), for example, uses data such as the size of a state's military in terms of personnel, military spending, population, and steel production to assess a state's overall national capability in the form of a real number generated by a quantitative calculation. This methodology is standardized for all states from 1816 to the present, thus enabling comparisons and ease of use for further data-based research and analysis.[210] Several studies use the CoW CINC for correlational analysis. For example, Adams tests "the hypotheses that attack and conquest are best explained by relative capabilities".[211]

Composite indices are not necessarily summations of individual, quantitative components; rather, the final number may be the result of a mathematical equation that combines and weighs the individual inputs in a manner that makes theoretical sense.

As a medium-*n* study, chapter 5 is not "testing" an individual, nor is it conducting a broad study of a large number of subjects (whether individuals, countries, groups, etc.). Rather, the non-random sample of agreements (that is, all relevant agreements are included) are scored and not only compared to one another (similar to a cross-case comparison), but their scores are also correlated with the dependent variable of success.

Chapter 5's definition of success assesses whether the agreement was successful during the executor's lifetime. This is a slightly different measure of success than in chapter 6, which primarily bases the assessment of success on the presence or absence of conflict between state parties. Nine independent and unidimensional variables were identified that compose delegation, and each variable was scored and added up to measure the amount of delegation for each agreement. Separately, each agreement was rated as successful, somewhat successful,

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[204] Salvatore Greco et al., "On the Methodological Framework of Composite Indices: A Review of the Issues of Weighting, Aggregation, and Robustness," *Social Indicators Research* 141, no. 1 (January 2019): 61–94, https://doi.org/10.1007/s11205-017-1832-9.
[205] James R. Hollyer, B. Peter Rosendorff, and James Raymond Vreeland, "Measuring Transparency," *Political Analysis* 22, no. 4 (2014): 413–34, https://doi.org/10.1093/pan/mpu001.
[206] Mark Copelovitch, Christopher Gandrud, and Mark Hallerberg, "Financial Data Transparency, International Institutions, and Sovereign Borrowing Costs," *International Studies Quarterly* 62, no. 1 (March 1, 2018): 23–41, https://doi.org/10.1093/isq/sqx082.
[207] "The ABCs of the CPI: How the Corruption Perceptions Index Is Calculated," Transparency.org, December 20, 2021, https://www.transparency.org/en/news/how-cpi-scores-are-calculated.
[208] William Lippert, "Military Balancing for Future Conventional Arms Control Agreements in Europe," *Contemporary Military Challenges* 26, no. 1 (March 1, 2024): 103–17, https://doi.org/10.2478/cmc-2024-0007.
[209] Yun-han Chu, ed., *How East Asians View Democracy* (New York: Columbia University Press, 2008).
[210] Greig and Enterline, "Correlates of War Database, National Material Capabilities (v6.0)."
[211] Adams, "Attack and Conquer? International Anarchy and the Offense-Defense-Deterrence Balance."

or unsuccessful. Thereafter, the data was analyzed to assess the extent of correlation between delegation and agreement success.

Chapter 6: Conventional Arms Control Agreements in Europe: Conditions of Success and Failure

In order to answer the question: *Under what conditions are adversarial CAC agreements in Europe successful or unsuccessful?* Chapter 6 uses QCA because this method is ideal for understanding how different conditions individually and in combination may result in certain outcomes; in this study, CAC agreement success or failure. As Schneider and Wagemann emphasize, QCA "focuses attention on unraveling causally complex patterns in terms of equifinality, conjunctural causation, and asymmetry… and can be useful for concept formation, the creation of typologies, and causal analysis."[212] QCA's focus on scoring membership in a set is appropriate for CAC as some aspects of CAC, such as demilitarization and national limitations, do not lend themselves well to correlational studies as these traits are binary in nature rather than being valued along a continuous scale.

What characterizes QCA is that it identifies multiple conjunctural causation by determining which pathways lead to outcomes with equifinality based on set theory.[213] That is, it identifies which combinations of conditions result in any given outcome; in particular, it shows how different combinations can result in the same outcome.

The methodology section in chapter 6 offers some details on how QCA is applied, with an overview of the methodology, the use of truth tables, and the calculations of pathways. This section's discussion of QCA is intended to complement what is written in chapter 6.

QCA is not yet widely used in international relations or international security, even though many international relations and security outcomes (conflict, peace, rivalries, alliances, etc.) are likely the result of a combination of causes or factors with variation between each case. According to Ide and Mello, there have been only 45 international relations-oriented QCA articles published in peer-reviewed, academic journals from 1987-2020.[214] Ide and Mello believe that "compared to regression analysis or case studies, QCA is still an emerging method in IR."[215]

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[212] Schneider and Wagemann, *Set-Theoretic Methods for the Social Sciences*, 8.
[213] Schneider and Wagemann, chap. Introduction.
[214] Tobias Ide and Patrick A Mello, "QCA in International Relations: A Review of Strengths, Pitfalls, and Empirical Applications," *International Studies Review* 24, no. 1 (March 4, 2022): viac008, https://doi.org/10.1093/isr/viac008.
[215] Ide and Mello, 7.

QCA can complement other research methods. This chapter's data is based on four conditions that may characterize CAC agreements: delegation to agreement implementers, national limitations, demilitarization, great power rivalry, and the outcome of success or failure. Scoring of success and failure are based on a combination of factors including duration of effectiveness, whether they are still in force, and whether the state parties went to war on issues related to the agreement. The four conditions and the outcomes are calibrated for a score between 1 and 0 (inclusive) to create a data table. The data table was then converted into a truth table using the fsQCA software,[216] after which the data analysis was conducted to analyze causal pathways and necessary and sufficient conditions with the fsQCA software.

Determining the scores for the four conditions and outcomes required within-case analysis, as none of the conditions or outcomes could be quantitatively calculated (calibrated) based on an existing quantitative figure such as spending, population, or land mass.[217] QCA is also appropriate for this dissertation's topic and, perhaps in many IR topic areas, because of the medium number of cases for which QCA is ideally suited. A small number of cases are not appropriate for QCA because it relies on a variety of conditions and outcomes to offer the most interesting insights, while a large case size may conceal some of the insights that QCA offers. Moreover, a large case size may prohibit the case-based knowledge that should accompany QCA – although large-n QCA studies are possible.[218]

One of QCA's advantages is that it can identify necessary and sufficient conditions and INUS conditions. INUS conditions are those conditions that are "an insufficient but necessary part of a condition, which is itself unnecessary but sufficient for the result."[219] For international relations this is especially relevant as for some outcomes it may be common that an outcome requires a certain condition, but only with other conditions present; and alternatively, the presence of a certain condition will always result in a certain outcome, but that outcome may also occur without that condition.

Several examples of QCA used in international security studies are worth mentioning. Haesebrouck and Thiem apply a multivariate QCA (mvQCA) methodology along with other

[216] Charles C. Ragin and Sean Davey, "Fuzzy-Set/Qualitative Comparative Analysis 4.0 for Mac" (Irvine, California: Department of Sociology, University of California, 2022).
[217] The delegation condition was based on the quantitative sum-score from chapter 6 – but these were all based on within-case analysis and scoring based on qualitative information.
[218] Roel Rutten, "Applying and Assessing Large-N QCA: Causality and Robustness From a Critical Realist Perspective," *Sociological Methods & Research* 51, no. 3 (August 2022): 1211–43, https://doi.org/10.1177/0049124120914955.
[219] J L Mackie, "Causes and Conditions," 2024, 245. See also Gary Goertz, *Multimethod Research, Causal Mechanisms, and Case Studies: An Integrated Approach* (Princeton University Press, 2017), https://doi.org/10.1515/9781400888115.

methods to assess "Burden Sharing in CSDP Military Operations" (or EU Common Security and Defense Policy).[220] Its nine conditions are based on a mix of qualitative and quantitative data, with some of the data having been derived from formulas that incorporate several variables. Haesebrouck's article "NATO Burden Sharing in Libya: A Fuzzy Set Qualitative Comparative Analysis"[221] was chapter 6's model both in its approach and in its presentation. In this article, Haesebrouck clearly presents two truth tables – for the presence and absence of the outcome (high burden) – and the intermediate solution, with additional tables and solutions in the appendix. His conditions and outcome are quantitatively derived from various formulas or other data, such as military spending and geographic position (in km).

Haesbrouck, in his article "NATO Burden Sharing after the Wales Summit: A Generalized Set Qualitative Analysis", uses a relatively newer version of QCA called generalized set QCA (gsQCA) which "can process multivalent fuzzy set variables."[222] The condition "threat" is a multi-value fuzzy set condition wherein the value is calculated differently for states which (as with his other studies mentioned above) serve as the study's cases (this dissertation's chapter 6 cases are individual CAC agreements or agreement sets). Another study by Haesbrouck, this one with van Immerseel, "When does politics stop at the water's edge? A QCA of parliamentary consensus on military deployment decisions,"[223] analyzes partisanship and foreign policy between states' parliaments and executive branches. One interesting aspect of this article is its presentation of an integrated process model which shows the different pathways to the two outcomes of political consensus or political contestation in a wire diagram. The seven variables in the diagram are translated into fsQCA with seven conditions, with a presentation of the parsimonious solutions (instead of the more commonly presented intermediate solutions). The authors also discuss deviant cases which are not explained by the formulas.

The above studies authored by Haesbrouck (singly or co-authored) are based on conditions that are easily applied to all of his cases from either a theoretical or quantitative

[220] Tim Haesebrouck and Alrik Thiem, "Burden Sharing in CSDP Military Operations," *Defence and Peace Economics* 29, no. 7 (November 10, 2018): 748–65, https://doi.org/10.1080/10242694.2017.1320183.
[221] Tim Haesebrouck, "NATO Burden Sharing in Libya: A Fuzzy Set Qualitative Comparative Analysis," *Journal of Conflict Resolution* 61, no. 10 (November 2017): 2235–61, https://doi.org/10.1177/0022002715626248.
[222] Tim Haesebrouck, "NATO Burden Sharing after the Wales Summit: A Generalized Set Qualitative Analysis," *Defence and Peace Economics* 33, no. 6 (August 18, 2022): 645, https://doi.org/10.1080/10242694.2021.1928435.
[223] Tim Haesebrouck and Anouschka Van Immerseel, "When Does Politics Stop at the Water's Edge? A QCA of Parliamentary Consensus on Military Deployment Decisions," *European Political Science Review* 12, no. 3 (August 2020): 371–90, https://doi.org/10.1017/S1755773920000223.

perspective. That is, every case could be quantitatively measured along the variables such as geography, spending, or political leanings in contrast to this dissertation's chapter 6 study which, for at least three of the conditions, are yes/no (present/absent) rather than a quantitative or qualitative range.

Although adversarial CAC has not been a focus of QCA studies, Böller's article "Brakeman or booster? Presidents, ideological polarization, reciprocity, and the politics of US arms control"[224] assesses US policies and approaches to 24 international arms control treaties from 1963-2001 to assess when the US would support or oppose arms control agreements. This study focuses on the "enhanced parsimonious" solution to analyze the pathways. Tangentially related to this dissertation's topic is Heinkelmann-Wild and Jankauskas' article "To Yield or Shield?",[225] in which the authors use csQCA to assess how IOs react to criticism from the Trump administration based on a dataset of IOs that the US was a member of, and then counting each instance of contestation as a case for a total of 32 cases. As with this dissertation's chapter 5 study, the conditions are all quantifications of qualitative information. The main interest of this study aside from its application of QCA is that some of the cases involve international security IOs (particularly NATO and IAEA), and chapter 6 of this dissertation focuses on international organizations and their role in CAC agreement implementation.

QCA offers many advantages as a unique way to analyze data, but it has (like any method) drawbacks. First, the varied approaches and presentation suggest that there is either inconsistency or lack of consensus on if, and when, there is a best approach, set of steps, or standardized presentation formats. For example, studies cited above applied different forms of QCA – although a case can be made that csQCA is just a narrower form of fsQCA. Other differences include whether the focus should be on the parsimonious, intermediate, or complex solutions. More fundamentally, skeptics may ask if QCA is identifying causes as effectively as its advocates claim.[226] Arel-Bundock also broadly criticizes QCA for what amounts to the many

[224] Florian Böller, "Brakeman or Booster? Presidents, Ideological Polarization, Reciprocity, and the Politics of US Arms Control," *International Politics* 59, no. 4 (August 2022): 725–48, https://doi.org/10.1057/s41311-021-00330-3.
[225] Tim Heinkelmann-Wild and Vytautas Jankauskas, "To Yield or Shield? Comparing International Public Administrations' Responses to Member States' Policy Contestation," *Journal of Comparative Policy Analysis: Research and Practice* 24, no. 3 (May 4, 2022): 296–312, https://doi.org/10.1080/13876988.2020.1822144.
[226] Vincent Arel-Bundock, "The Double Bind of Qualitative Comparative Analysis," *Sociological Methods & Research* 51, no. 3 (August 2022): 963–82, https://doi.org/10.1177/0049124119882460; Tim Haesebrouck and Eva Thomann, "Introduction: Causation, Inferences, and Solution Types in Configurational Comparative Methods," *Quality & Quantity* 56, no. 4 (July 29, 2021): 1867–88, https://doi.org/10.1007/s11135-021-01209-4.

subjective steps that the methodology incorporates such as "classification problems, [and] typological ambiguity."[227]

Most QCA studies, including chapter 6 in this dissertation, attempt to address these concerns by, among other means, explaining their choices, providing their data and calculations, and providing the three different types of solutions. Often some of this information is presented in the main text and then additional information is offered in appendices and supplemental information. Moreover, QCA experts such as Mello, Ragin, and Rutten emphasize that some of the objections to QCA are manifest in other methodologies and that ultimately a researcher needs to continuously assess findings in line with their overall knowledge and expertise.

Chapter 7: How Conventional Arms Control Failures Caused the Russo-Ukraine War

In order to answer the question: *What role did CAC agreements failures play in Russia's decision to invade Ukraine?* chapter 7 uses a within-case study with process tracing and counterfactual analysis of Russian President Putin's decision to invade Ukraine in February 2022 and hypothesizes that one of the main causes of the invasion was the deterioration of CAC in Europe. Process tracing is ideal for understanding why certain policy decisions are made. It "is a research method for tracing causal mechanisms using detailed, within-case empirical analysis of how a causal mechanism operated in real-world cases. Process-tracing can be used both for case studies that aim to gain a greater understanding of the causal dynamics that produced the outcome of a particular historical case."[228] Counterfactuals test alternate explanations,[229] which is necessary as there are many causes attributed to practitioners and scholars – and articulated by Putin himself – as to why the decision was made to invade Ukraine.

[227] Arel-Bundock, "The Double Bind of Qualitative Comparative Analysis," 964.
[228] Derek Beach and Rasmus Brun Pedersen, *Process-Tracing Methods: Foundations and Guidelines*, 2nd ed. (University of Michigan Press, 2019), 1, https://books.google.nl/books?id=ae1ruwEACAAJ.
[229] Gary Goertz and James Mahoney, "9: Counterfactuals," in *A Tale of Two Cultures: Qualitative and Quantitative Research in the Social Sciences* (Princeton: Princeton University Press, 2013), 248, https://doi.org/10.1515/9781400845446; Levy, "Counterfactuals and Case Studies."

Process Tracing

This chapter is a single case study that applies process tracing, a within-case method[230] to understand and assess Russian views of the military balance with NATO, how CAC did and could address this, and how Russian views of CAC failure resulted in the war's outbreak. The hypothesis is further tested, after detailed process tracing, with a relatively brief counterfactual which assesses not only what the impact would have been had CAC succeeded in Europe, but also assesses the counterfactual if other claimed causes had been absent.

"Process tracing consists of analyzing a case into a sequence (or several concatenating sequences) of events and showing how those events are plausibly linked given the interests and situations faced by groups or individual actors."[231] Process tracing may be inductive or deductive[232] and applies to any social or scientific phenomenon in which there may be a complex cause and effect, although it is generally used in contrast to covariate methods because process tracing itself is first and foremost a qualitative method. As Collier notes, process tracing "offers a sharp contrast to mainstream statistical methods of hypothesis testing, which are based on cross-case analysis."[233] Similarly, Bennett and Elman note that process tracing involves "relentless empirical research on these hypothesized processes, using a wide variety of sources (often including archived documents, contemporary news accounts, secondary histories, biographies or memoirs, and interviews) with due attention to the potential motivated and informational biases of each source."[234] When a case study such as Putin's decision to invade Ukraine focuses on human decisions, *factual* quantitative data such as economic trends, force comparisons, popular opinion polls, etc., may be much less important than policymakers' *perceptions* of quantitative data. That is to say that while quantitative data may assist in understanding war causation historically, perceptions may be more relevant to understanding decisions within individual cases – and process tracing offers probably the best method to understand decision-making.

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[230] David Collier, "Within-Case versus Cross-Case Causal Analysis," in *A Tale of Two Cultures: Qualitative and Quantitative Research in the Social Sciences* (Princeton: Princeton University Press, 2013), chap. 7, https://doi.org/10.1515/9781400845446-008.
[231] Jack A. Goldstone, "Comparative Historical Analysis And Knowledge Accumulation In The Study Of Revolutions," in *Comparative Historical Analysis in the Social Sciences*, ed. James Mahoney and Dietrich Rueschemeyer, 1st ed. (Cambridge University Press, 2003), 47, https://doi.org/10.1017/CBO9780511803963.003.
[232] Bennett and Elman, "Case Study Methods in the International Relations Subfield."
[233] Collier, "Within-Case versus Cross-Case Causal Analysis," 93.
[234] Bennett and Elman, "Case Study Methods in the International Relations Subfield," 183.

In the area of history and international relations, process tracing may look at, for example, a series of events, decisions, or circumstances to identify an explanation, or theory, of a certain outcome. As Bennett and Elman note, process tracing is ideal for the "detailed study of particular cases with sensitivity to sequencing, the use of process tracing to gain inferential leverage on rare or unique events, the opportunity to study cases inductively to help identify omitted variables, and the ability to study interaction effects in the context of particular cases."[235] Process tracing is a method to firmly identify, with confidence, key causes of events while discarding other causes.[236] In contrast to a general history or chronology which seeks to tell a broad story (history) of interest, that is a detailed and compelling descriptive narrative, pattern tracing focuses on elements that identify and assess a hypothesized cause or causes of usually important and noteworthy outcomes. The tracing is identifying, observing, and analyzing "empirical fingerprints, or traces, left by the operation of a causal mechanism in a case."[237]

Process tracing often requires a detailed understanding of both the event being studied and of many other subject areas[238] because of the lack of quantifiable data which may be relatively easily manipulated to reveal relations (or lack thereof). In the case of the Russo-Ukraine War's outbreak, not only is it necessary to consider the post-Cold War history of CAC to explain how it might have been a major cause of the war, but some amount of knowledge was necessary to put CAC in the context other issues such as history, economics and trade, culture and to consider alternate explanations.

Some process tracing studies might have more than one case in their sample size, especially if the goal is to test a theory in several cases. The theory itself could be the product of a single case study subjected to process tracing.[239] An example of a small *n* process study in international security might be that lobbying by defense industry officials causes major industrial states to go to war.

One of process tracing's tools is the application of up to four types of tests: straw-in-the-wind, hoop, smoking gun, and doubly decisive. These tests are essentially a continuum of establishing causation with certainty, with a hoop test being the weakest (that is the hypothesis is not eliminated but is not strongly affirmed or countered) and the doubly decisive test

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[235] Andrew Bennett and Colin Elman, "Complex Causal Relations and Case Study Methods: The Example of Path Dependence," *Political Analysis* 14, no. 3 (2006): 251, https://doi.org/10.1093/pan/mpj020.
[236] Bennett and Elman, "Complex Causal Relations and Case Study Methods."
[237] Beach and Pedersen, *Process-Tracing Methods: Foundations and Guidelines*, 2.
[238] Goldstone, "Comparative Historical Analysis And Knowledge Accumulation In The Study Of Revolutions."
[239] Møller and Skaaning, "Explanatory Typologies as a Nested Strategy of Inquiry."

confirming the hypothesis and eliminating all others.[240] Chapter 7's study conducted tests against these four measures to bolster the hypotheses' affirmation.

Chapter 7 is focused on explaining outcome process tracing – that is specifically explaining why Russia invaded Ukraine. Three other process tracing variants are theory testing, theory building, and theoretical revision.[241] Explaining outcome process tracing is common and ideally suited for singular events – whether these are outliers or extremes of a larger dataset, or whether they are simply of great interest in and of themselves. Two historical cases that lend themselves to process tracing are the Cuban Missile Crisis and the outbreak of World War One. While identifying causes for either can have general theoretical implications for crisis decision-making and rivalries, the cases in and of themselves are significant enough to warrant within-case theory building through explaining outcome process tracing solely to understand the cases.[242]

Counterfactual

Counterfactuals can go hand-in-hand with process tracing[243] for within-case qualitative analysis. Counterfactuals are, as discussed in further detail in chapter 7, an alternate history that seeks to demonstrate the impact a given event or variable had or did not have. Though not without its detractors, counterfactuals are a useful logical and intellectual tool to test qualitative hypotheses which propose one thing was the chief cause of another thing. This is done by showing that x had outcome y, but not x results in not y. As with any other method that seeks to establish causation, counterfactual analysis seeks to establish a causal relationship and present evidence that shows that a change in x results in a change in y.[244]

For serious research counterfactuals, versus conversational, several guidelines should be considered and followed. First, counterfactuals should be something that is well within the realm of possibility.[245] This sets aside not just the fantastic such as extra-terrestrial intervention, but even the less likely. The "miracle" counterfactual that Putin had a crystal ball dream vision of Russia's high losses in Ukraine would not be in line with how serious counterfactuals should be done, not the least again because it does not offer insights as to why the decision to invade

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[240] David Collier, "Understanding Process Tracing," *PS: Political Science & Politics* 44, no. 4 (October 2011): tbl. 1, https://doi.org/10.1017/S1049096511001429.
[241] Beach and Pedersen, *Process-Tracing Methods: Foundations and Guidelines*, tbl. 1.
[242] Beach and Pedersen, 285.
[243] Collier, "Within-Case versus Cross-Case Causal Analysis."
[244] Levy, "Counterfactuals and Case Studies."
[245] Goertz and Mahoney, "9: Counterfactuals."

was made. However, what counterfactuals are realistically possible is a matter of subjectivity; or, as Goertz and Mahoney phrase it, a "judgment about reasonableness… that depends heavily on the analyst's knowledge of the case and its history."[246]

In the case of CAC and NATO-Russian relations, it is not difficult to envision a counterfactual wherein CAC succeeded. Without going into too much substantive detail, NATO members and Russia did attempt throughout the period leading up to at least 2015 to make CAC work – in CFE implementation, A/CFE signature and entry into force, and continuous discussions about compliance and implementation in forums such as the OSCE and JCG. CAC success is, as an example of a realistic counterfactual, more likely than Russia joining NATO or NATO never expanding after 1991.

Second, counterfactuals should not compel a major alteration or rewrite of history.[247] A prosperous CAC regime would not necessarily require altering more than a small number of events and policies in Russian-NATO and Russian-Ukrainian relations. CAC could have been preserved and reinforced while keeping all other events (variables) equal, such as NATO expansion in terms of membership, the Maidan revolution, the presence of Russian minorities in Ukraine, and the overall history of Ukraine and Russia. As an example of changing too much, a counterfactual which posits that if Hillary Clinton was on her second term and Putin had been overthrown in 2020 and replaced by a West-friendly leader, there would not have been an invasion. This may be true – but it changes too many variables to understand why Putin decided to invade Ukraine.

Some counterfactuals focus on a very narrow, singular event. In some cases, the counterfactual is self-evident. If John Wilkes Booth had not assassinated US President Abraham Lincoln (for example, his gun failed, or he missed), then Lincoln would have continued to serve as President. No information suggests that he would have later been assassinated. Thus, the cause-effect of Booth shooting at Lincoln and Lincoln's death is self-evident but what is less certain – and a legitimate counterfactual analysis – is what effect Lincoln's survival and continued Presidency would have on US Reconstruction. Similarly, historians may pose the counterfactual question that if Archduke Ferdinand had not been assassinated, would World War One have ever happened.

Yet unlike the two examples above, chapter 7 does not rely on a single event. There was no one moment in which CAC had decisively failed. Rather, it was a slow but steady

[246] Goertz and Mahoney, 121.
[247] Goertz and Mahoney, "9: Counterfactuals."

deterioration, manifested both in the declining effectiveness and application of existing agreements and the failure to adopt new ones. Considering a series (or process) of counterfactuals within the same body of policy is in line with counterfactual methodology and complements pattern tracing.[248] Moreover, assessing a set of decisions and policies within a broader policy makes logical sense as most of the explanations of Russia's invasion are not based on a single incident such as an assassination. All of them address root causes and a series of policies and their result. Not even Putin suggested that the invasion was due to any singular incident, event, or decision. This contrasts, for example, with the outbreak of World War Two in Europe and the Pacific being begun by two events: The (false flag) Polish attack against Germany in Gleiwitz, and the Japanese bombing of Pearl Harbor. Even the 1931 Japanese invasion of Manchuria which set into motion the Pacific War was caused by a singular (false flag) event.

Useful counterfactuals, no matter how well conceived and executed, fundamentally suffer from their untestability – at least in the areas of history and conflict. There is simply no way to rewind time and change something to see how history would have been altered. Yet, counterfactuals nonetheless complement process tracing methods in establishing the cause of certain outcomes.

CAC Agreement Dataset

Three chapters of this dissertation are based on a comprehensive dataset of CAC agreements from 1918 to 2015 (the most recent CAC agreement in Europe) which are consolidated in Table 1. Table 6 below states the number of cases in each chapter's dataset. The differences in the number of cases are primarily due to additional agreements having been identified and incorporated over the course of the research, although chapter 4 includes the A/CFE Treaty as it assesses the status quo prior to the agreement and the balance set by the agreement. These remain relevant and measurable even though the A/CFE Treaty did not enter into force.

[248] Goertz and Mahoney.

Table 6: Number of cases in each chapter's dataset

Chapter	**Number of Cases**	**Explanation**
Status Quo Constancy and Conventional Arms Control	29	Additional cases as the methodology evolved and due to further research.
Delegation to Treaty Bodies and International Organizations for Conventional Arms Control Agreements in Europe: A Sum Score Evaluation	19	First set of cases researched
Conventional Arms Control Agreements in Europe: Conditions of Success and Failure	22	Addition of some cases, in part as requested by the editors.

Several traits differentiate these datasets from case datasets used in other arms control studies:

- The timeframe, as other treaty datasets have either a narrower or broader timeframe;
- The focus is on formal, adversarial agreements, as other datasets include universal and counterproliferation arms control, as well as CSBMs;
- This dataset only includes agreements that have a substantial CAC component. Thus, unlike many other arms control agreement datasets, primarily nuclear weapons-oriented, are excluded;
- Inclusion of agreements that do not involve the US/NATO-Russia/Soviet Union/Warsaw Pact rivalries, as other treaty datasets focus on these.

This dataset has consolidated several agreements into a single agreement case. The post-World War One peace treaties were signed between the Allies and the defeated Central powers – several of which were new states with the breakup of the Austro-Hungarian empire. The agreements were similar in approaches, setting strict limits on a range of military capabilities. One agreement in this period that was not included is the Brest-Litovsk Treaty between Imperial Germany and Soviet Russia, because of this treaty's brief existence and its annulation when Germany surrendered. The Allies based the peace treaties that they drafted following the one with Germany on that agreement's text and approach.

Similarly, the World War Two treaties between the Allies and Axis states in Europe were consolidated, although these had more variety than their First World War counterparts and were often composed of a series of agreements spanning several years. For data coding purposes, the treaties had similar characteristics such as the imposition of the Allied Councils and Control Commissions (ACCs) and demands for general demobilization. The 1940 Finnish-Soviet Union peace treaty is included as an individual case in the dataset despite its brief lifetime because it not only set out clear CAC conditions (on Finland) but it was also nullified by conflict rather than, in the case of Brest-Litovsk, circumstances beyond the state parties' relationship.

Agreements that created multiple protocols and amendments were considered, in general, as one agreement. For example, the CFE Treaty included several additional protocols to deal with various issues, including the politically-binding establishment of personnel limits. Its most significant alteration was the "Flank Agreement" which required US Senate ratification. All of these are considered as a single agreement.

The 1998 Belfast Agreement ending conflict in Northern Ireland, also known as the Good Friday Agreement, was included in this dataset. This inclusion is rare, if not unique; it does not appear in any other discussions of CAC in Europe. This thesis includes the agreement for several reasons: the creation of not one but two agreement executors, both of which were highly independent and qualified as international organizations; the establishment of qualitative limits on British military forces in Northern Ireland; and the historical adversarial relationship between Ireland (as part of the United Kingdom, in varying degrees until quasi-independence in 1922) and the UK.

The 1954 Protocol No. IV on the Agency of Western European Union for the Control of Armaments is only minimally discussed in the CAC literature, but is included in this dataset because it is the product of a historic rivalry between Germany and other WEU members (all of whom, at the time of signature, had been at war with Germany during the Second World War); and because the dynamic limits (based on Germany's military capability goals established by NATO) were in place out of fear that Germany could again threaten its western neighbors.

The variables and conditions for chapters 4-6 were determined for the agreement cases, after which the data was coded for each variable and condition based on available information, including the treaty texts. The conditions and variables were selected in part based on them being potentially applicable to all the agreements. That is, none of the conditions or variables are a logical impossibility, which would be the case if, for example, nuclear arms were included as these were only possible from 1945.

The research methodologies used in this thesis offer different types of analyses and offer different perspectives from which to understand the phenomenon of CAC. Taken together, they permit a unique set of conclusions which are discussed in chapter 8.