

ARTICLE

IRON DOME AND *JUS AD BELLUM* PROPORTIONALITY

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ABSTRACT

As Israel's most significant air defense system that can almost hermetically protect Israel's home front from rockets and missiles, Iron Dome has increased the degree of asymmetry in modern warfare. Unilateral deployment of an advanced air defense system during armed conflict may minimize casualties on the defending side but create blunt contrast in casualty balance. The deployment of Iron Dome during the 2014 Gaza War contributed to the overwhelming asymmetry in civilian casualties—only six in Israel compared with around 1,462 civilians in Gaza—leading to claims of Israel's lack of compliance with the jus ad bellum principle of proportionality. Iron Dome revolutionized the Israeli-Palestinian conflict and shaped the latest escalation of violence between Israel and Hamas in May 2021.

This Article examines the existing theories of jus ad bellum proportionality and considers whether the extreme casualty asymmetry exacerbated by Iron Dome's use should influence its application. While contemporary theory stresses the importance of qualitative proportionality, the acute casualty asymmetry resulting from Iron Dome's use in the 2014 Gaza War and the 2021 Israel-Palestinian crisis has resulted in a paradigm shift toward quantitative proportionality. This Article argues that, while the shift toward quantitative proportionality has a natural “eye-for-an-eye” appeal, it contradicts modern understanding of proportionality in international law. Specifically, the shift impairs the distinction between jus ad bellum and jus in bello and undermines efforts to ensure that technologically sophisticated nations comply with international law. The Article further assesses whether the paradigm shift is desirable and whether the use of advanced air defense

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systems should influence assessments of proportionality from a qualitative perspective.

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INTRODUCTION

In earlier times, before the start of battle, soldiers with swords in hand quietly waited for the order to attack. Regardless of whether they won or lost, opposing generals knew with certainty that fatalities and injuries would occur on both sides. With the development of technologically sophisticated and efficient defense systems, present-day armed attacks by less technologically advanced aggressors may result in no fatalities at all, but still trigger a defensive counterattack that results in a high number of casualties.

After the latest escalation of violence between Israel and Hamas in May 2021, it became very much clear that the parties to the conflict were not each other's equals, most notably so due to Israel's technologically sophisticated military capabilities.¹ Such extreme asymmetry had much to do with Iron Dome, Israel's efficient defense system.

Asymmetrical warfare is described as “a situation where an adversary can take advantage of its strengths or an opponent's

¹ Some scholars have long described the Israeli-Palestinian power balance as asymmetric due to differences in technological capabilities. *See, e.g.,* Robert D. Sloane, *Puzzles of Proportion and the Reasonable Military Commander: Reflections on the Law, Ethics, and Geopolitics of Proportionality*, 6 HARV. NAT'L SEC. J. 299, 332 (2015). However, as this Article will demonstrate, Israel's new defense mechanism has aggravated such asymmetry.

weaknesses.”² An actor employs asymmetrical warfare to maintain its advantage in order to pursue its goals: “In the realm of military affairs and national security, asymmetry is acting, organizing, and thinking differently than opponents in order to maximize one's own advantages, exploit an opponent's weaknesses, attain the initiative, or gain greater freedom of action.”³

Asymmetry increasingly characterizes modern warfare because of increasingly common armed conflicts between adversaries with vastly different military capabilities.⁴ The term “asymmetrical warfare” has been used “primarily in relation to the growing technological gap in conventional military capabilities between Western countries . . . and non-Western countries.”⁵ Indeed, while asymmetry can take different forms,⁶ its most notable dimension in modern conflict is technological asymmetry, “which occurs when one side of a conflict possesses superior weapon systems and other military equipment.”⁷

Modern international law differentiates *jus ad bellum* from *jus in bello*. *Jus ad bellum* prohibits the use of force,⁸ with the exceptions of the right to self-defense⁹ and use of force under the auspices of the United Nations Security Council (“SC”).¹⁰ *Jus in bello* aims to balance the necessities of armed conflict with maintaining humanity by “setting clear limits on the conduct of military operations.”¹¹ While asymmetry in technological advancements had arguably influenced *jus in bello* positively, as modern weapons are more precise and thus reduce collateral damage,

² ROGER W. BARNETT, ASYMMETRICAL WARFARE: TODAY'S CHALLENGE TO U.S. MILITARY POWER 15 (2003).

³ STEVEN METZ & DOUGLAS V. JOHNSON II, ASYMMETRY AND U.S. MILITARY STRATEGY: DEFINITION, BACKGROUND, AND STRATEGIC CONCEPTS 5 (2001).

⁴ See Laurie R. Blank, *The Application of IHL in the Goldstone Report: A Critical Commentary*, in 12 Y.B. INT'L HUMANITARIAN L. 347, 355 (2009).

⁵ Wyn Q. Bowen, *The Dimensions of Asymmetric Warfare*, in THE CHANGING FACE OF MILITARY POWER 15, 15 (Andrew Dorman ed., 2002).

⁶ See METZ & JOHNSON II, *supra* note 3, at 5–6 (“[Asymmetrical warfare] can be *political-strategic*, *military-strategic*, *operational*, or a *combination* of these. It can entail different *methods*, *technologies*, *values*, *organizations*, *time perspectives*, or some *combination* of these.”).

⁷ Michael N. Schmitt, *Asymmetrical Warfare and International Humanitarian Law*, 62 A.F. L. REV. 1, 5 (2008).

⁸ U.N. Charter art. 2, ¶ 4.

⁹ *Id.* at art. 51.

¹⁰ *Id.*

¹¹ Jasmine Moussa, *Can Jus ad Bellum Override Jus in Bello? Reaffirming the Separation of the Two Bodies of Law*, 90 INT'L REV. RED CROSS 963, 965 (2008).

such assessment becomes more complex with regard to *jus ad bellum*.¹² For example, scholars point out that technological advancements in aircraft, including unmanned aerial vehicles, have made it easier for strong states in an asymmetrical conflict to attack with reduced danger of casualties.¹³

Indeed, advanced air defense systems (“AADS”), which have a high success rate in intercepting rockets and missiles, have vastly increased the prevalence of asymmetrical warfare. The use of AADS has the potential to further increase the asymmetry of modern conflicts because the state that deploys it, even if it is heavily bombed, may protect its civilians from harm at an unprecedented rate.

The 2014 Gaza War saw the introduction of Israel’s AADS—Iron Dome.¹⁴ Despite adversaries launching approximately 4,000 missiles at the Israeli home front, the use of Iron Dome resulted in only six civilian casualties on the Israeli side, in stark contrast to the 2,251 Palestinians casualties resulting from Israeli attacks, of whom approximately 1,462 were civilians.¹⁵ While Iron Dome, a defensive system, did not inflict the

¹² See Martin L. Cook & Mark Conversino, *Asymmetric Air War: Ethical Implications*, in THE MORAL DIMENSION OF ASYMMETRICAL WARFARE 47, 50 (Th. A. van Baarda & D.E.M. Verweij eds., 2009) (“This great success on the *jus in bello* side of things produced an unanticipated effect on the *jus ad bellum* side of the equation.”). Not all commentators agree that asymmetrical warfare has positive effects in *jus in bello*. See, e.g., Suzy Killmister, *Remote Weaponry: The Ethical Implications*, 25 J. APPLIED PHIL. 121, 122 (2008) (asserting that asymmetrical warfare pushes weak parties to violate their *in bello* obligations in order to have a standing chance in the armed conflict).

¹³ See Cook & Conversino, *supra* note 12, at 50 (“Political leaders who, prior to development of these technologies, would have thought long and hard about going to the military instrument of national power . . . now were tempted to reach for it more quickly and with less weighty deliberation.”); Bradley J. Strawser, *Moral Predators: The Duty to Employ Uninhabited Aerial Vehicles*, 9 J. MIL. ETHICS 342, 358 (2010) (“The worry here is that the asymmetry in combat abilities created by the advanced technology of UAVs . . . makes it too easy for the nation employing UAVs to go to war. That is, the asymmetry created by UAVs lowers the *jus ad bellum* threshold such that more unjust wars might be conducted because the risks of war to a nation-state could become so minimal.”); *id.* at 359 (“The scope of this issue . . . strikes at *any* asymmetry in military technological development whatsoever.”).

¹⁴ Iron Dome is part of Israel’s multi-tiered missile defense system, which also includes Arrow 2, Arrow 3, Iron Beam, Barak 8, and David’s Sling. However, Iron Dome is the most dominant AADS due its interception success rate. See Daphné Richemond-Barak & Ayal Feinberg, *The Irony of the Iron Dome: Intelligent Defense Systems, Law, and Security*, 7 HARV. NAT’L SEC. J. 469, 495 (2016).

¹⁵ Rep. of the Detailed Findings of the Indep. Comm’n of Inquiry Established Pursuant to Human Rights Council Resolution S-21/1, ¶ 574, U.N. Doc. A/HRC/29/CRP.4 (June 24, 2015) [hereinafter *Indep. Comm’n of Inquiry*]. Israel has asserted that 761 of the casualties

Palestinian casualties itself, its success in defending Israel from missile and rockets attacks exacerbated the casualty asymmetry. The success of Iron Dome's defensive capabilities thus served as the basis for many of the criticisms regarding Israel's lack of *jus ad bellum* proportionality.

This Article examines whether the casualty asymmetry resulting from Israel's use of Iron Dome is relevant to conceptions of proportionality under *jus ad bellum* theory.¹⁶ Such an examination is critical because a flawed analysis of proportionality may be both detrimental to the accused nation and easier for that nation to contradict. For example, if claims of disproportionality are based on a flawed understanding of the term, Israel may respond to the misuse of the term rather than honestly examine whether it has complied with the proportionality requirements of international law. Therefore, misuse of the term proportionality may hinder effective examination of compliance with international law's proportionality requirements.

It should be noted that different classifications of the armed conflict might lead to different conclusions regarding the existence of Israel's right to self-defense. For example, Dugard claimed that Israel's actions during the 2014 Gaza War should "not be seen as an act of self-defense by a state subjected to acts of aggression by a foreign state or nonstate actor. Instead, it should be seen as the action of an occupying power aimed at maintaining its occupation."¹⁷ Since this article discusses the effect of Iron Dome on the assessment of proportionality within the self-defense framework, such arguments, important as they are, will not be discussed here. The analysis

were civilians rather than 1,462. STATE OF ISRAEL, THE 2014 GAZA CONFLICT: FACTUAL AND LEGAL ASPECTS 2 (2015).

¹⁶ This article operates under the assumption that Israel had a right of self-defense in the 2014 and 2021 conflicts and examines the disagreement over whether it exercised proportionality in exercising that right. Some scholars have concluded that Israel did not have a right to self-defense in 2014 or in other conflicts. *See, e.g.*, John Dugard, *Debunking Israel's Self-defense Argument*, ALJAZEERA AMERICA (July 31, 2014), <http://america.aljazeera.com/opinions/2014/7/gaza-israel-internationalpoliticsunicc.html> [<https://perma.cc/M7N5-R8N9>] (stating that Israel's actions during the 2014 Gaza War should "not be seen as an act of self-defense by a state subjected to acts of aggression by a foreign state or nonstate actor. Instead, [they] should be seen as the action of an occupying power aimed at maintaining its occupation"); *see also* Sharon Weill & Valentina Azarova, *The 2014 Gaza War: Reflections on Jus ad Bellum, Jus in Bello, and Accountability*, in THE WAR REPORT: ARMED CONFLICT IN 2014 360, 367–68 (Annyssa Bellal ed., 2015). Such arguments, as important as they are, are outside of the scope of this analysis.

¹⁷ Dugard, *supra* note 16; *see also* Weill & Azarova, *supra* note 16, at 367–68.

focuses on sources accepting that Israel has a right of self-defense but criticizing it for lack of proportionality while acting in self-defense.¹⁸

I. PROPORTIONALITY IN JUS AD BELLUM

The concept of proportionality is an integral component of just war theory. Historically, proportionality in just war theory required assessing whether “the overall evil a war would cause was balanced by the good that would be achieved.”¹⁹ Seventeenth-century Dutch political theorist Hugo Grotius suggested that even with a just cause for war, a ruler should balance the potential suffering with the benefits that it may bring.²⁰ During the nineteenth century, the principle of proportionality in the use of force was largely disregarded, but it reemerged following the famous *Caroline* affair.²¹ During the Canadian insurrection of 1837, British forces destroyed the privately owned United States steamboat *Caroline*.²² The diplomatic correspondence following the incident has “produced what is now generally agreed to be the authoritative articulation of customary international law regarding the limitations that constrain uses of force by nations in self-defense.”²³ In correspondence with the British Foreign Secretary Lord Ashburn, the United States Secretary of State Daniel Webster stated that:

It will be for it to show, also, that the local authorities of Canada, even supposing the necessity of the moment . . . did nothing unreasonable or excessive; since the act, justified by the necessity of self-defence, must be limited by that necessity, and kept clearly within it.²⁴

The adoption of the United Nations Charter in 1945 revived the discussion regarding proportionality. The aftermath of World War II brought the international community to the realization that a preventive regime for the use of force is crucial, since “peace and security from war

¹⁸ JUDITH GARDAM, NECESSITY, PROPORTIONALITY AND THE USE OF FORCE BY STATES 33 (2004) (“The concept of proportionality was an integral component of just war theory. [...] Once that judgment was made, the conduct of war was of secondary concern.”).

¹⁹ *Id.*; see also PAUL RAMSEY, WAR AND THE CHRISTIAN CONSCIENCE: HOW SHALL MODERN WAR BE CONDUCTED JUSTLY? 34–36 (1961).

²⁰ HUGO GROTIUS, THE RIGHTS OF WAR AND PEACE 567 (Richard Tuck ed., 2005).

²¹ See Martin A. Rogoff & Edward Collins, Jr., *The Caroline Incident and the Development of International Law*, 16 BROOK. J. INT’L L. 493, 494 (1990).

²² *Id.* at 493.

²³ *Id.* at 526.

²⁴ See Robert Y. Jennings, *The Caroline and McLeod Cases*, 32 AM. J. INT’L L. 82, 89 (1938).

became the paramount interest of the new international order.”²⁵ Under the guidance of Churchill, Roosevelt, and Stalin, states gathered to adopt the UN Charter at the San Francisco Conference on June 26, 1945.²⁶ Article 2(4) of the Charter imposes a prohibition on the use of force between states, providing that “[a]ll Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations.”²⁷ Article 2(4) is widely recognized as reflecting customary international law,²⁸ and similar provisions can be found in many international treaties signed after the Charter.²⁹ The exceptions to Article 2(4) are use of force under the auspices of the SC³⁰ and use of force in self-defense under Article 51.³¹ While commentators and states remain divided on the terms for which resorting to force is deemed lawful, they have consistently agreed that use of force must be proportionate.³² However, commentators understand differently the definition and application of proportionality and, as Gardam points out, the question of “proportionate to what?”³³ Indeed, a lack of clarity and consensus characterizes *jus ad bellum* proportionality.³⁴ Bowett believes

²⁵ Gabriella Blum, *The Crime and Punishment of States*, 38 YALE J. INT’L L. 57, 69 (2013).

²⁶ CHRISTIAN HENDERSON, THE USE OF FORCE AND INTERNATIONAL LAW 15 (2018).

²⁷ U.N. Charter art. 2, ¶ 4.

²⁸ See HENDERSON, *supra* note 26, at 17; Military and Paramilitary Activities in and Against Nicaragua (Nicar. v. U.S.), Judgment, 1986 I.C.J. 14, ¶ 34 (June 27) (“There can be no doubt that the issues of the use of force and collective self-defence raised in the present proceedings are issues which are regulated both by customary international law and by treaties, in particular the United Nations Charter.”).

²⁹ See, e.g., United Nations Convention on the Law of the Sea, *opened for signature* Dec. 10, 1982, 1833 U.N.T.S. 397 (entered into force Nov. 16, 1994); Rome Statute of the International Criminal Court, art. 8 *bis*, July 17, 1998, 2187 U.N.T.S. 90; G.A. Res. 2625 (XXV), Principle 1 (Oct. 24, 1970); Inter-American Treaty of Reciprocal Assistance art. 1, Sept. 2, 1947, 62 Stat. 1681, 21 U.N.T.S. 77; Helsinki Final Act of the Conference on Security and Co-operation in Europe art. 1(a)(II), Aug. 1, 1975, 14 I.L.M. 1292.

³⁰ U.N. Charter art. 42.

³¹ *Id.* at art. 51.

³² GARDAM, *supra* note 18, at 11 (“Despite wide differences expressed by commentators and as evidenced in the practice of States as to when the resort to force is legitimate in international law, there has been consistent agreement ever since the adoption of the United Nations Charter on the need for any forceful action, irrespective of its legal basis, to be proportionate”); see also C.H.M. Waldock, *The Regulation of the Use of Force by Individual States in International Law*, 81 COLLECTED COURSES OF THE HAGUE ACAD. OF INT’L L. 455, 463–64 (1952); 1 D. P. O’CONNELL, THE INTERNATIONAL LAW OF SEA 1096 (I.A. Shearer ed., 1982).

³³ GARDAM, *supra* note 18, at 12.

³⁴ Dapo Akande & Thomas Liefänder, *Clarifying Necessity, Imminence, and Proportionality in the Law of Self-Defense*, 107 AM. J. INT’L L. 563, 566–68 (July 2013)

that responses should be proportional to threats; Higgins measures proportionality against inflicted injury; and Waldock regards proportionality as that which is required to achieve a state's objective.³⁵

Kretzmer's research demonstrates the variance in understandings of proportionality in *jus ad bellum* among international law scholars and practitioners.³⁶ He analyzed the assessment of proportionality as presented in the *American Society of International Law Newsletter* report on the 2006 Israeli military campaign against Hezbollah in Lebanon to determine the various understandings of proportionality from the perspectives of five distinguished international lawyers, all of whom were members of the American Society of International Law Executive Council.³⁷ Remarkably, the lawyers each had a different understanding of proportionality, which affected how they assessed Israel's compliance with the proportionality requirement.³⁸ For example, one compared the damage that Hezbollah caused with the scope of the Israeli response, while another considered whether the force used was "required to deter and protect against further attacks."³⁹ While all agreed that proportionality plays a key role in *jus ad bellum*, their responses clearly indicated that the meaning of the principle is shrouded in uncertainty.⁴⁰ Contemporary scholars are similarly divided. Some take the view that it is the very decision to resort to force that must meet a proportionality test.⁴¹ Others adopt what has been termed a "tit for tat" approach,⁴² under which the amount of force that A used as a

("There is a profound lack of clarity and consensus as to the test to be applied with regard to the proportionality requirement in the *jus ad bellum*.").

³⁵ D.W. BOWETT, SELF-DEFENCE IN INTERNATIONAL LAW 269 (1958); ROSALYN HIGGINS, PROBLEMS AND PROCESS 231 (1995) (citing John Lawrence Hargrove, *The Nicaragua Judgment and the Future of the Law of Force and Self-Defence*, 81 AM. J. INT'L L. 135, 136 (1987); Waldock, *supra* note 32, at 463–64.

³⁶ See David Kretzmer, *The Inherent Right to Self-Defence and Proportionality in Jus ad Bellum*, 24 EUR. J. INT'L L. 235, 236 (2013).

³⁷ *Id.*; 22(5) *Newsletter*, ASIL NEWSLETTER (The Am. Society of Int'l L., Washington, D.C.) Sept./Oct. 2006, at 1.

³⁸ See Kretzmer, *supra* note 36, at 236.

³⁹ *Id.*

⁴⁰ *Id.* at 237.

⁴¹ Nick Fotion, *Proportionality*, in MORAL CONSTRAINTS ON WAR: PRINCIPLES AND CASES 91, 91–98 (Bruno Coppieters & Nick Fotion eds., 2002); Thomas M. Franck, *On Proportionality of Countermeasures in International Law*, 102 AM. J. INT'L L. 715, 721 (2008).

⁴² See ANTHONY CLARK AREND & ROBERT J. BECK, INTERNATIONAL LAW AND THE USE OF FORCE: BEYOND THE U.N. CHARTER PARADIGM 165–66 (1993); Albrecht Randelzhofer, *Action with Respect to Threats to the Peace, Breaches of the Peace, and Acts of Aggression: Article 51*, in 1 THE CHARTER OF THE UNITED NATIONS: A COMMENTARY 788, 805 (Bruno Simma ed., 2d ed. 2002).

countermeasure against B must be proportionate to the force that B previously used.⁴³

Tit-for-tat or quantitative proportionality has gained limited support from states and international tribunals.⁴⁴ For example, Russia justified its use of force in self-defense against Georgia in 2008, arguing that it did not go beyond the scale of attacks to which it was subjected.⁴⁵ Further, the International Court of Justice showed some support for quantitative proportionality in both the *Military and Paramilitary Activities in and Against Nicaragua* (*Nicaragua v. United States of America*)⁴⁶ and *Oil Platforms* (*Islamic Republic of Iran v. United States of America*)⁴⁷ cases.

However, most contemporary scholars do not support quantitative proportionality. They instead endorse the perception that proportionality should be judged against the legitimate ends of the use of force⁴⁸ or the threat posed by the opposing force,⁴⁹ an approach referred to as means–end or qualitative proportionality.⁵⁰ Within this approach, there are various opinions on what entails a justifiable end:

All accept that a state acting in self-defence may halt and repel an ongoing armed attack, but there is a singular lack of

⁴³ Kretzmer, *supra* note 36, at 237.

⁴⁴ See HENDERSON, *supra* note 26, at 235–36.

⁴⁵ Letter dated Aug. 11, 2008 from the Permanent Representative of the Russian Federation to the U.N. addressed to the President of the Sec. Council, U.N. Doc. S/2008/545.

⁴⁶ *Military and Paramilitary Activities in and Against Nicaragua* (Nicar. v. U.S.), Judgment, 1986 I.C.J. 14, ¶ 237 (June 27) (“Whatever uncertainty may exist as to the exact scale of the aid received by the Salvadorian armed opposition from Nicaragua, it is clear that these latter United States activities in question could not have been proportionate to that aid.”).

⁴⁷ *Oil Platforms* (Iran v. U.S.), Judgment, 2003 I.C.J. 161, ¶ 77 (Nov. 6) (“As a response to the mining, by an unidentified agency, of a single United States warship, which was severely damaged but not sunk, and without loss of life, neither Operation Praying Mantis’ as a whole, nor even that part of it that destroyed the Salman and Nasr platforms, can be regarded, in the circumstances of this case, as a proportionate use of force in self-defence.”).

⁴⁸ GARDAM, *supra* note 18, at 11; OLIVIER CORTEN, *THE LAW AGAINST WAR: THE PROHIBITION ON THE USE OF FORCE IN CONTEMPORARY INTERNATIONAL LAW* 470 (2010); Enzo Cannizzaro, *The Role of Proportionality in the Law of International Countermeasures*, 12 EUR. J. OF INT’L L. 889, 889 (2001); MICHAEL W. DOYLE, *STRIKING FIRST: PREEMPTION AND PREVENTION IN INTERNATIONAL CONFLICT* 10 (2008).

⁴⁹ IAN BROWNLIE, *INTERNATIONAL LAW AND THE USE OF FORCE BY STATES* 261 (1963); LINDSAY MOIR, *REAPPRAISING THE RESORT TO FORCE: INTERNATIONAL LAW, JUS AD BELLUM AND THE WAR ON TERROR* 68–70 (2010).

⁵⁰ Kretzmer, *supra* note 36, at 237; Dieter Fleck, *The Law Applicable to Peace Operations*, in *THE OXFORD HANDBOOK OF INTERNATIONAL LAW IN ARMED CONFLICT* 206, 245–47 (Andrew Clapham & Paola Gaeta eds., 2014).

agreement on whether it may also act to prevent or deter further armed attacks from the same enemy. What ends are legitimate becomes especially acute when the response in self-defence takes place after the attack has been carried out and completed, and there is no longer an attack to halt or repel, or when the armed attack has not yet occurred but is imminent.⁵¹

Kretzmer advocates that means–end proportionality should be accompanied by the narrow proportionality test, which requires that the harm caused by the necessary means does not outweigh the expected benefits.⁵² However, the narrow proportionality test has not yet been accepted in mainstream *jus ad bellum* theory and has been the focus of limited academic discussion.⁵³

One reason for the confusion regarding proportionality in *jus ad bellum* is the possibility that the quantitative approach still influences the assessment of proportionality, even when the assessment is presented as qualitative. Indeed, quantitative proportionality is somewhat intuitive because it “satisfies a sense of symmetry between attack and defence.”⁵⁴

Further, given its vague parameters, the assessment of proportionality risks being subject to manipulation and may be shaped by bias.⁵⁵ Kretzmer suggested that as parties to a conflict, “uninvolved states and outside observers will often be highly selective in deciding whether use of force was both justified and proportionate.”⁵⁶ This bias may arise from their sympathies (or lack thereof) toward the involved state.⁵⁷ In many cases, the choice of a qualitative or quantitative assessment will have little

⁵¹ Kretzmer, *supra* note 36, at 239.

⁵² *Id.* at 240.

⁵³ *Id.* at 278.

⁵⁴ Enzo Cannizzaro, *Contextualizing Proportionality: Jus ad Bellum and Jus in Bello in the Lebanese War*, 88 INT’L REV. RED CROSS 779, 783 (2006).

⁵⁵ See Kretzmer, *supra* note 36, at 238.

⁵⁶ *Id.* (“States that are themselves faced with armed attacks or threats of such attacks are inevitably going to have a different perspective from uninvolved states. The perspective of the latter is likely to change radically once they too are faced with an attack. The bias of involved states is self-evident.”).

⁵⁷ See *id.* (“When force is used in situations in which [uninvolved states] have sympathy for the victim state, and little or no sympathy for the state or group that provoked the use of force by that state, they are not likely to be critical of the force used However, when similar force is used by a state to which they are either unsympathetic or outwardly hostile, or when they actually identify with some or all of the goals of the state or group whose actions provoked the use of force, they are likely to condemn that use of force as disproportionate.”).

effect in determining whether the proportionality requirement has been met.⁵⁸ However, the choice between qualitative and quantitative proportionality has significant effects for analysis of asymmetrical conflicts—such as when the more technologically sophisticated party is using an AADS—as the quantitative casualty asymmetry may belie other factors influencing an assessment of proportionality that emerges when using a qualitative means-end approach.

Another issue that needs to be addressed with regard to the application of *jus ad bellum* proportionality is the temporal assessment of proportionality. Traditionally, there were two competing approaches for assessing *jus ad bellum* proportionality. The *static approach* holds that *ad bellum* proportionality ceases to apply once one has made the initial judgment on the resort to force.⁵⁹ This approach is most famously identified with Dinstein, who later retracted his support for it.⁶⁰ The *continuous application approach* assumes that *jus ad bellum* proportionality continues to apply throughout the armed conflict.⁶¹ This approach is most famously identified with Greenwood,⁶² and most modern commentators, including this Article's author, have accepted it.⁶³ This Article thus assumes continuous application of *jus ad bellum* proportionality.

⁵⁸ See Cannizzaro, *supra* note 54, at 784.

⁵⁹ Eliav Lieblich, *On the Continuous and Concurrent Application of ad Bellum and in Bello Proportionality*, in NECESSITY AND PROPORTIONALITY IN INTERNATIONAL PEACE AND SECURITY LAW 41, 44 (Claus Kress & Robert Lawless eds., 2020) (“The static approach is rather simple. On this view, once a just cause is established for a resort to force (in law, mainly, an armed attack), and a certain level of confrontation begins or is reached, *jus ad bellum* is no longer relevant. Rather, we now move to the realm of *jus in bello*, in which we analyze the legality of each attack, but no longer the legality of the operation as a whole.”).

⁶⁰ YORAM DINSTEIN, WAR, AGGRESSION AND SELF-DEFENCE 13–16 (6th ed. 2017).

⁶¹ Lieblich, *supra* note 59, at 46–47.

⁶² See generally Christopher Greenwood, *The Relationship Between Ius ad Bellum and Ius in Bello*, 9 REV. INT'L STUD. 221 (1983).

⁶³ See Lieblich, *supra* note 59, at 46 n.15 (citing Greenwood, *supra* note 62); Judith Gail Gardam, *Proportionality and Force in International Law*, 87 AM. J. INT'L L. 391, 404 (1993); Françoise J. Hampson, *Belligerent Reprisals and the 1977 Protocols to the Geneva Conventions of 1949*, 37 INT'L & COMP. L.Q. 818, 821, 836 (1988); Raphaël van Steenberghe, *Proportionality Under Jus ad Bellum and Jus in Bello: Clarifying Their Relationship*, 45 ISR. L. REV. 107, 113 (2012); Julian M. Lehmann, *All Necessary Means to Protect Civilians: What the Intervention in Libya Says About the Relationship Between the Jus in Bello and the Jus ad Bellum*, 17 J. CONFLICT & SEC. L. 117, 129 (2012); Robert D. Sloane, *The Cost of Conflation: Preserving the Dualism of Jus ad Bellum and Jus in Bello in the Contemporary Law of War*, 34 YALE J. INT'L L. 47, 67–68 (2009); Avril McDonald, *Declarations of War and Belligerent Parties: International Law Governing Hostilities Between States and Transnational Terrorist Networks*, 54 NETH. INT'L L. REV. 279, 294 (2007); Moussa, *supra* note 11, at 968; Mary Ellen O'Connell, *Combatants and the Combat Zone*, 43 U. RICH. L. REV. 845, 861–62 (2009).

II. DO ADVANCED AIR DEFENSE SYSTEMS AFFECT PROPORTIONALITY?

A. *Iron Dome and the 2014 Gaza War*

Iron Dome, developed by Rafael Advanced Defense Systems and Israel Aerospace Industries, and partially funded by the United States, is arguably the most successful AADS to date. While the United States and Russia have developed and deployed AADS of their own, data are lacking on their success rates.⁶⁴ Iron Dome has demonstrated operational performance in intercepting and destroying short-range rockets and artillery shells fired from a distance of 2.5 to 43 miles (4 to 70 kilometers).⁶⁵ Iron Dome is capable of estimating a projectile's point of impact and likely damage, a capability that it uses to determine whether to intercept the projectile.⁶⁶

Iron Dome made its operational debut during the 2012 Gaza War (Operation Pillar of Defense) and was used again with substantive improvements during the 2014 Gaza War (Operation Protective Edge).⁶⁷ Its interception success rate was reportedly 84% in 2012, increasing to 91% in 2014.⁶⁸ While some commentators have contested these figures, there is consensus regarding the overall success of the system.⁶⁹ Given its remarkable capabilities and advanced technology, Iron Dome has generated much interest:

The Iron Dome, the defense system used by Israel to counter incoming enemy projectiles, is something of a technological wonder. The system's ability to predict the trajectory of rockets, intercept salvos of rockets of differing sizes, and sustain this activity over long periods of time has left laymen

⁶⁴ The United States' MIM-104 Patriot missile system—which the United States and its allies, including Israel, employ—and Russia's S-400 are both AADS. See Shea Cotton & Jeffrey Lewis, *The Global Missile Defense Race: Strong Test Records and Poor Operational Performance*, NUCLEAR THREAT INITIATIVE (Sept. 16, 2020), <https://www.nti.org/analysis/articles/global-missile-defense-race-strong-test-records-and-poor-operational-performance/> [<https://perma.cc/HYY5-7953>]. However, scholars have noted a lack of data on the operational success rate of either system. See Richemond-Barak & Feinberg, *supra* note 14, at 472–73 & n.6.

⁶⁵ Oren Bar-Gill & Gabriella Blum, *Defenses*, 97 TEX. L. REV. 881, 889 (2019).

⁶⁶ See STATE OF ISRAEL, *supra* note 15, at 111.

⁶⁷ See Bar-Gill & Blum, *supra* note 65, at 889–90.

⁶⁸ *Id.* at 890.

⁶⁹ *Id.*

and experts equally stunned. Its operational success, combined with the rapid proliferation of mortars, rockets, and missiles into conflict areas, has generated significant interest on the part of states.⁷⁰

While the capabilities of Iron Dome were promising in 2012, its 2014 version significantly shifted the balance of power between Israel and Palestinian combatants.⁷¹ Operation Protective Edge was launched as a response to a series of events, which eventually Israel considered to be an armed attack. This series of events occurred as follows. On June 12, 2014 Hamas militants kidnapped and killed three Israeli teens in the West Bank.⁷² Initially, Israel believed that the teens were alive, and a military operation called “Shuvu Ahim” (Brother’s Keeper) was launched to locate them.⁷³ During the operation, Israeli authorities arrested hundreds of Hamas activists.⁷⁴ In response, Hamas launched rockets from Gaza at Israel; Israeli warplanes responded by carrying out air strikes against Hamas targets in Gaza.⁷⁵ On July 2nd, a group of Israelis kidnapped and burned to death a Palestinian teenager from East Jerusalem in retaliation for the murder of the three teens.⁷⁶ The violent murder of the Palestinian teenager triggered riots in East Jerusalem, “which quickly escalated to daily rocket fire from Gaza.”⁷⁷ Around the same time that these hostilities were breaking out, the Israel Defense Forces (“IDF”) had discovered a channel of tunnels that Hamas had dug to infiltrate Israel.⁷⁸ Although smuggling tunnels had been used in Gaza since the mid-1990s, the Israeli government and the public regarded these newly discovered “combat tunnels”—some of which were designed to facilitate attacks on Israeli civilians and soldiers—as a significant threat.⁷⁹ On July 7th, Hamas launched more than sixty rockets at the south of Israel, and on July 8th, they fired rockets at Jerusalem, Tel Aviv, and Haifa.⁸⁰ At this point, Israel launched Operation Protective Edge, a

⁷⁰ Richemond-Barak & Feinberg, *supra* note 14, at 472.

⁷¹ *Id.* at 483–88 (describing substantial differences in Iron’s Dome’s capabilities and impacts in 2012 and 2014).

⁷² STATE OF ISRAEL, *supra* note 15, at 25.

⁷³ *Id.* at 25–26.

⁷⁴ RAPHAEL S. COHEN ET AL., FROM CAST LEAD TO PROTECTIVE EDGE: LESSONS FROM ISRAEL’S WARS IN GAZA 80–81 (2017).

⁷⁵ *Id.* at 81.

⁷⁶ *Id.*

⁷⁷ *Id.*

⁷⁸ See DAPHNÉ RICHEMOND-BARAK, UNDERGROUND WARFARE 27–28 (2018).

⁷⁹ *Id.* at 22, 28.

⁸⁰ COHEN ET AL., *supra* note 74, at 82.

military campaign "which focused on reducing the ongoing and imminent threat of attacks, in order to protect its civilian population."⁸¹

During the 2014 Gaza War, the effectiveness of Iron Dome demonstrated that Israel had been almost hermetically shielded, leading to minimal casualties despite heavy indiscriminate mortar fire. After-action reports attribute the remarkably few Israeli civilian casualties during the 2014 Gaza War (six in total) to the protection that Iron Dome provided, as well as to other defenses such as early warning systems and sirens, public safety guidelines, and residential and public infrastructure hardening.⁸² Despite the fact that Hamas launched 4,000 rockets at civilian targets in Israel (in addition to the 500 rockets directed at military targets) in the 2014 war, mortars and rockets fired from Gaza directly killed only six Israeli civilians.⁸³ Were it not for Iron Dome, the number of casualties could have been significantly higher.⁸⁴

According to Israeli authorities, the death toll on the Palestinian side in the 2014 War amounted to 2,125 casualties; of these, Israel identified 936 as militants, 761 as civilians, and the remainder as unknown.⁸⁵ According to a United Nations Commission of Inquiry report, the death toll in Gaza was 2,251 Palestinians, of which 1,462 were civilians.⁸⁶ Thus, in the 2014 conflict, Palestine suffered vastly more combatant and civilian casualties than Israel did. After upgrades following its 2012 deployment, Iron Dome became a key factor in this outcome.

The 2014 Gaza War has been subject to criticism as a disproportionate response. Legal experts, media personnel, and politicians have attributed the casualty asymmetry in the 2014 Gaza War to IDF's disproportionate use of force.⁸⁷ While some of this criticism explicitly refers

⁸¹ STATE OF ISRAEL, *supra* note 15, at x.

⁸² *Id.* at xiv.

⁸³ *Id.* at xii.

⁸⁴ Emily B. Landau & Azriel Bermant, *Iron Dome Protection: Missile Defense in Israel's Security Concept*, in THE LESSONS OF OPERATION PROTECTIVE EDGE 37, 37 (Anat Kurz and Shlomo Brom eds., 2014).

⁸⁵ STATE OF ISRAEL, *supra* note 15, at 2.

⁸⁶ Indep. Comm'n of Inquiry, *supra* note 15, ¶ 574.

⁸⁷ See Alon Cohen & Raphael Bitton, *The Threshold Requirement in Asymmetric Conflicts: A Game Theory Analysis*, 16 CHI. J. INT'L L. 43, 74 n.79 (2015) ("In the military clash between Israel and Hamas in Gaza during the summer of 2014, Hamas launched more than 100 rockets and mortars a day for 50 days on Israeli civilians. Yet the anti-rockets system Iron Dome exhibited Israel's technological superiority, leaving almost zero casualties among Israeli civilians as a result of these rockets. Therefore, many classified Israel's strikes on Gaza as excessive using that argument exactly."); Benjamin Wittes, *Israeli*

to *jus ad bellum* proportionality, in other cases the reference to *ad bellum* rather than *in bello* is to be inferred from the context. There are also further criticisms that combine *ad bellum* and *in bello* proportionality analysis.

Criticism that Israel did not employ force proportionally has, in turn, resulted in claims that critics are defining proportionality inaccurately. For example, one commentator expressed dismay that media sources were focusing on a quantitative conception of proportionality, a concern at odds with widespread academic support for a more holistic, qualitative theory of proportionality:

Targeting Procedures and the Concept of Proportionality, LAWFARE (Dec. 15, 2015), <https://www.lawfareblog.com/israeli-targeting-procedures-and-concept-proportionality> [https://perma.cc/FC62-GFDQ] (“The trouble is that, at least colloquially, we use the terms “proportionality” and “proportional” to incorporate several other ideas too. . . . First, there’s proportionality of casualties between the sides. In Operation Protective Edge, according to Israel figures, 2,125 Palestinians died, and—on the other side—72 Israelis (six civilians and 66 soldiers) died. This disparity, a difference of a factor of 30, cries disproportionality to a great many observers.”); Súsanna J. Christiansen, *Has the Iron Dome Changed the Legitimacy of Responding to Rocket Threats?* 25 (Mar. 1, 2015) (unpublished M.A. thesis, Tel Aviv University), <http://www.samfeligid.fo/media/1114/thesis-has-the-iron-dome-changed-the-legitimacy-of-responding-to-rocket-threats.pdf> [https://perma.cc/J7Q4-BW2D] (“Proportionality is sometimes misperceived as a matter of comparing number of deaths on one side to number of deaths on the other side.”); Elizabeth M. Bartels, *Is Iron Dome a Poisoned Chalice? Strategic Risks from Tactical Success*, REAL CLEAR DEF.: THE BRIDGE (Nov. 29, 2017), <https://thestrategybridge.org/the-bridge/2017/11/29/is-iron-dome-a-poisoned-chalice-strategic-risks-from-tactical-success> [https://perma.cc/S9GL-UNA3] (“These tactical benefits came with unintended strategic costs for Israel. First, effective missile defense created the perception of a disproportional conflict, in which Palestinians suffered while Israelis remained relatively safe.”); Landau & Bermant, *supra* note 84, at 41 (“Israel’s success in limiting civilian casualties has been cynically turned against it in the international debate by those who have accused Israel of a disproportionate response.”); Jonathan Topaz, *Poll: 42 Percent Say Israel Justified*, POLITICO (May 8, 2014), <https://www.politico.com/story/2014/08/poll-israel-justified-hamas-gaza-palestine-109717> [https://perma.cc/6TWY-3XSG] (“Israel has faced increasing criticism for its actions in Gaza and the conflict’s disproportionate death toll. Almost 1,900 Palestinians, mostly civilians, have been killed since July 8, compared with 64 Israeli soldiers and three civilians, according to The Associated Press.”); Daily Mail Comment, *A Deeply Troubling Response to Hamas*, DAILY MAIL AUSTL. (July 30, 2014), <https://www.dailymail.co.uk/debate/article-2711479/DAILY-MAIL-COMMENT-A-deeply-troubling-response-Hamas.html> [https://perma.cc/U69M-3E8T] (“But with more than 20 Palestinians dying for every Israeli soldier killed, how can any civilised country describe this as a proportionate response?”). For additional media references to the unbalanced death toll as a sign of Israel’s disproportionate response in self-defense, see, e.g., Lesley D. Klaff & Stephen Riley, *Israel, ‘Disproportionate’ Force and the Media: Misconstruing the Laws of War*, 25 EUR. J. CURRENT LEGAL ISSUES (2019).

Large sections of the media have misconstrued the doctrine of proportionality in relation to Israel and have incorrectly used it to mean either inequality of death or civilian suffering between the Israelis and Palestinians or inequality of military might between the two. This misreading of the doctrine of proportionality means that there is a relative consensus within the international media that, although Israel has a right to defend itself . . . its use of force is ‘disproportionate.’⁸⁸

Ron Dermer raised similar concerns when he was Israel’s ambassador to the United States. He noted that many critics of Israel’s 2014 military action have misconceived proportionality, as they consider it to be a demand of a balanced death toll between adversaries:

Disproportionate is believed to be what is the body count on both sides. So therefore if there’s 600 and something Palestinians who were killed and 25 Israelis, or a few days ago when there were 200 Palestinians and one Israeli, that is deemed to be a disproportionate response. That’s how most people deal with it.⁸⁹

While Ambassador Dermer may be correct that certain public commentators lack a strong grasp of *jus ad bellum* theory, discourse on the inequality in body counts arising from the use of AADS is not limited to politics or media reports; international law scholars and global leaders have incorporated casualty asymmetry in analyzing proportionality.⁹⁰ For example, Andriola argues that the unbalanced casualty rate during the 2014 Gaza War demonstrated Israel’s lack of compliance with *jus ad bellum* proportionality:

By July 31, 2014, over 1,400 Palestinians had been killed, roughly 1,050 of which were civilians. . . . This means that *jus ad bellum* proportionality needs to be determined primarily by reference to rocket attacks, which were the original reasons given for Protective Edge, for all civilian

⁸⁸ Klaff & Riley, *supra* note 87.

⁸⁹ Zeke J. Miller, *Israeli Ambassador: Here’s What “Proportionality” in War Really Means*, TIME (July 22, 2014), <http://time.com/3019833/gaza-israel-war-death-rocket-invasion/> [<https://perma.cc/MS22-F6HC>].

⁹⁰ See Robert D. Sloane, *Puzzles of Proportion and the “Reasonable Military Commander”*: Reflections on the Law, Ethics, and Geopolitics of Proportionality, 6 HARV. NAT’L SEC. J. 299, 301 (2015).

destruction and lives lost from July 8th to July 31st. Considering an Israeli had not been killed by a Palestinian rocket during peacetime in three years, the case for Israel's compliance with *jus ad bellum* proportionality seems weak.⁹¹

Sumina and Gilmore have also concluded that the asymmetric death toll in the 2014 Gaza War provided evidence of lack of proportionality, tying the death toll with disproportionality claims:

The death toll alone speaks volumes: 2251 Palestinians were killed, including 1462 Palestinian civilians with 299 women and 551 children. In the first month of Operation Protective Edge, nearly 1500 Palestinians were killed compared to roughly 45 Israelis: a ratio of 33.3 to 1.⁹²

Mark Ellis, the executive director of the International Bar Association, regarded the defensive capabilities of Iron Dome as changing the proportionality standards by which Israel must comply, tying *jus in bello* to *jus ad bellum*:

It is actually Israel's defensive capabilities and power that have changed the legal parameters of the current conflict. . . . With a quasi-unassailable Israel, as a result of its Iron Dome defense shield, the military advantage of the operations in Gaza is difficult, if not impossible, to balance against the scale of civilian casualties and the vast destruction of civilian infrastructure. Although it may seem antithetical to the notion of self-defense, Israel has a greater legal duty to adhere to a higher proportionality standard because of its unique defensive stature.⁹³

⁹¹ Pat Andriola, *Did Israel Violate International Humanitarian Law During Operation Protective Edge?*, 30 EMORY INT'L L. REV. 2001, 2015 (2015).

⁹² Svetlana Sumina & Steven Gilmore, *The Failure of International Law in Palestine*, 20 THE SCHOLAR: ST. MARY'S L. REV. ON RACE AND SOC. JUST. 135, 171 (2018) (quoting Indep. Comm'n of Inquiry, *supra* note 15, ¶ 574).

⁹³ Mark S. Ellis, *The Changing Legal Standards for the War in Gaza*, HUFFPOST (Oct. 21, 2014), https://www.huffpost.com/entry/the-changing-legal-standards_b_5697496 [<https://perma.cc/2888-JARW>]; accord Gordon Marino, *Fearful Asymmetry: Should Israel Pull Its Punches?*, COMMONWEAL (Aug. 14, 2014), <https://www.commonwealmagazine.org/fearful-asymmetry> [<https://perma.cc/X8LN-JQK3>] (Regarding Iron Dome and the asymmetry it creates, "according to the rule of proportionality, it would be immoral to turn a country upside down because it's perceived to pose a minor threat.").

UN Secretary-General Ban Ki-moon used the unbalanced death toll as proof of an asymmetric response: “While I understand why Israel has to respond militarily, but there is a proportionality, and most of the death toll [has been among the] Palestinian people.”⁹⁴ UN Deputy Secretary-General Jan Eliasson similarly stated that “by looking at the number of civilian casualties, it should be apparent that Israel’s return of force was disproportionate,” listing casualty numbers as the only relevant component of proportionality.⁹⁵

States voiced similar views during SC deliberations regarding the 2014 Gaza War. For example, the representative for Egypt stated:

More than 600 Palestinians have been killed. At least 20 per cent of them were children, and the death count is rising. We condemn the disproportionate use of force. The Torah mandates an eye for an eye; it never called for taking 100 eyes for only 1.⁹⁶

The representative for Pakistan likewise stated:

It is not really war, because one side is mighty and well-armed and the other side is ill-equipped and using some projectiles. The Palestinians, who do not have a standing army, are being pummelled [*sic*] by one of the most modern and sophisticated military machines. There is no proportionality. The asymmetry could not be more glaring.⁹⁷

As Rabkin noted, immediate allegations of a disproportionate response that rely solely on casualty numbers may also give rise to a premature assessment of proportionality because an accurate qualitative determination of proportionality requires carefully assessing whether the

⁹⁴ Press Release, U.N. Sec’y-Gen. Ban Ki-moon, Secretary-General’s Press Remarks Prior to Meeting with US Secretary of State John Kerry, U.N. Press Release (July 21, 2014), <https://www.un.org/sg/en/content/sg/press-encounter/2014-07-21/secretary-generals-press-remarks-prior-meeting-wtih-us> [<https://perma.cc/2NWL-5UAH>].

⁹⁵ Anna Hiatt, *UN Says Israel’s Use of Force Against Hamas Is Disproportionate*, THE JERUSALEM POST (July 31, 2014), <https://www.jpost.com/Middle-East/UN-says-Israelis-use-of-force-against-Hamas-is-disproportionate-369503> [<https://perma.cc/SGJ2-BQDM>].

⁹⁶ U.N. SCOR, 69th year, 7222d mtg. at 31, U.N. Doc. S/PV.7222 (July 22, 2014), <https://digitallibrary.un.org/record/776028?ln=en> [<https://perma.cc/4GVG-NJWY>].

⁹⁷ *Id.* at 34.

force used is proportionate to its legitimate ends.⁹⁸ Such an assessment is not possible in an immediate time frame because it requires detailed information often unavailable in the immediate fog of war, as well as a careful examination of events.⁹⁹

In practice, it appears that in extreme cases of asymmetry caused by AADS, the balance of casualties matters to commentators, and the equation of actual harm inflicted is sometimes used to determine proportionality in *jus ad bellum*, even if academic literature has typically defined proportionality more qualitatively.¹⁰⁰ Part III of this Article will examine whether the paradigm shift toward a quantitative conception of proportionality is desirable, and whether the deployment of AADS should change the way in which proportionality in *jus ad bellum* is assessed.

B. Iron Dome and the 2021 Gaza Conflict

Iron Dome has seen continued use since the 2014 Gaza War. The 2019 escalation between Israel and Hamas involved a notable use of Iron Dome, although of a different magnitude than that in 2014. Of the nearly 700 rockets that Hamas and the Palestinian Islamic Jihad launched at Israel over the course of one weekend, Iron Dome managed to intercept only 240, resulting in four deaths, causing 200 injuries, and prompting concerns that Hamas had discovered a way to thwart the AADS.¹⁰¹ The conclusion was that Hamas had learned that Iron Dome possessed gaps in its coverage, especially for short-range rockets threatening communities near the border, and for simultaneous shooting of multiple rockets.¹⁰² These concerns led to meaningful improvements in the technological capabilities of Iron Dome in the following years. In March 2021, Rafael Advanced Defense Systems,

⁹⁸ Jeremy Rabkin, *Proportionality in Perspective: Historical Light on the Law of Armed Conflict*, 16 SAN DIEGO INT'L L.J. 263, 265–66 (2015). Rabkin refers to *in bello* analysis, but the principle may apply just as well to *ad bellum* analysis.

⁹⁹ *Id.*

¹⁰⁰ See *supra* Part I.

¹⁰¹ Sam Sokol, *700 Rockets, 240 Intercepts, 4 Dead Israelis: Is the Iron Dome Getting Worse?* JEWISH TELEGRAPHIC AGENCY (May 7, 2019), <https://www.jta.org/2019/05/07/israel/700-rockets-240-intercepts-4-dead-israelis-is-the-iron-dome-getting-worse> [https://perma.cc/5SKA-CEKB]; *Israel, Gaza Cease Hostilities; Netanyahu: Campaign Not over*, HAARETZ (May 6, 2019), <https://www.haaretz.com/israel-news/.premium-israel-gaza-cease-hostilities-netanyahu-campaign-not-over-1.7208366> [https://perma.cc/D8N4-QXAJ].

¹⁰² See Maayan Jaffe-Hoffman, *Why Isn't the Iron Dome Stopping These Deadly Rocket Attacks?*, JERUSALEM POST (May 6, 2019), <https://jpost.com/Arab-Israeli-Conflict/Why-isnt-the-Iron-Dome-stopping-these-deadly-rocket-attacks-588823/amp> [https://perma.cc/3VAG-A9YZ].

Iron Dome's developer, announced a significant upgrade in the system's technological capabilities, following a series of successful tests in which Iron Dome "successfully intercepted and destroyed targets, simulating existing and emerging threats, including the simultaneous interception of multiple UAVs, as well as a salvo of rockets and missiles."¹⁰³ It was only two months after Rafael's announcement that the new capabilities were put to practical use.

At the time of this Article's writing, only a few months passed since the end of the 2021 Israel-Gaza escalation, which Palestinians refer to as the Sword of Jerusalem, and Israelis call Operation Guardian of the Walls ("OGW").¹⁰⁴ As OGW has just concluded, an in-depth analysis of the campaign would be premature.¹⁰⁵ However, preliminary insights from the 2021 conflict provide some insight into the implications of Iron Dome use.

Just as in 2014, there were vastly more Palestinian than Israeli casualties in the 2021 conflict, in large part due to Iron Dome. This was the case despite OGW not including a ground operation in Gaza, but being limited to rocket attacks on Israel by Hamas and airstrikes on Gaza by Israel.¹⁰⁶ During OGW, Hamas reportedly fired over 3,150 rockets at Israel, and Israel attacked over 850 targets in Gaza.¹⁰⁷ Media sources have reported that during the eleven days of OGW, between June 10–21, 2021, at least 243 people were killed in Gaza, and twelve civilians were killed in Israel.¹⁰⁸

¹⁰³ *Additional Leap Forward in the Development of the Iron Dome*, RAFAEL AIR DEF. SYS. LTD., (Mar. 17, 2021), <https://www.rafael.co.il/press/additional-leap-forward-in-the-development-of-the-iron-dome/> [https://perma.cc/AVG9-KYY7].

¹⁰⁴ Assaf Orion, *Sword of Jerusalem vs. Guardian of the Walls: Gaza and the Next Lebanon War*, WASH. INST. OF NEAR EAST POL'Y, <https://www.washingtoninstitute.org/policy-analysis/sword-jerusalem-vs-guardian-walls-gaza-and-next-lebanon-war> [https://perma.cc/D6QK-CBV2].

¹⁰⁵ Reports and investigations regarding OGW have not been published yet, and new information will surely emerge with time.

¹⁰⁶ *Operation Guardian of the Walls*, ISRAEL MINISTRY OF FOREIGN AFF. (May 20, 2021), <https://mfa.gov.il/MFA/ForeignPolicy/Terrorism/Palestinian/Pages/Operation-Guardian-of-the-Walls-10-May-2021.aspx> [https://perma.cc/58RA-NNKH].

¹⁰⁷ *Id.* IDF's official website points to over 1,500 targets. See *Operation Guardian of the Walls*, ISRAEL DEF. FORCES, <https://www.idf.il/en/minisites/operation-guardian-of-the-walls/operation-guardian-of-the-walls> [https://perma.cc/MA7M-ZVBL].

¹⁰⁸ Udi Dekel, "Guardian of the Walls" - Complete and Unfinished, TEL AVIV UNIV. (May 23, 2021), <https://www.inss.org.il/he/publication/guardian-of-the-walls-continues/> [https://perma.cc/7Z8Y-PNG2]; *Gaza-Israel Conflict in Pictures: 11 Days of Destruction*, BBC NEWS (May 21, 2021), <https://www.bbc.com/news/world-middle-east-57205968> [https://perma.cc/3KMT-YU2R].

OGW resulted from events surrounding the Sheikh Jarrah controversy. Sheikh Jarrah is a neighbourhood located in occupied East Jerusalem, linking the Old City to Mount Scopus and to the northeast part of the city, which possesses great historical and geopolitical importance to both Palestinians and Israelis.¹⁰⁹

Sheikh Jarrah involves elaborate ownership history and a legal battle in Israeli courts over such ownership.¹¹⁰ By April 2021, an appeal in the matter of the eviction of four families residing in Sheikh Jarrah¹¹¹ was pending in the Supreme Court.¹¹²

The legal debate over Sheikh Jarrah received significant international attention. While Israeli officials portrayed the conflict as a real estate dispute that should be settled in court,¹¹³ critics argued that the eviction efforts are an institutionalized attempt of ethnic cleansing.¹¹⁴

Days before the Supreme Court was set to deliver its decision in the case of the four families, tension in Jerusalem had reached critical levels.¹¹⁵ Protests against the possible eviction of the four families mobilized across Jerusalem and throughout Israeli cities, “including Haifa, Jaffa, Nazareth, and Um Al-Fahem, as well as in cities across the West Bank and Gaza Strip.”¹¹⁶ The protests were met with police brutality, resulting in hundreds of injured protestors and one death.¹¹⁷ Perhaps the most violent clashes between protestors and Israeli police occurred in the Temple Mount (Al-

¹⁰⁹ YITZHAK REITER & LIOR LEHRS, THE JERUSALEM INST. FOR ISRAEL STUDIES, THE SHEIKH JARRAH AFFAIR: THE STRATEGIC IMPLICATIONS OF JEWISH SETTLEMENT IN AN ARAB NEIGHBORHOOD IN EAST JERUSALEM 6 (2010).

¹¹⁰ See CivA 6239/08 Muhammed Kamal Alqurd vs. The Sephardic Community Council, (Nevo, 2008) (Isr.); CivA 2401/21 Jauni vs. Nahalat Shim'on, (Nevo, 2021) (Isr.).

¹¹¹ The Iskafi family, Al-Kurd family, Al-Jauni family and Abu-Hasna family.

¹¹² CivA 2401/21 Jauni vs. Nahalat Shim'on, (Nevo, 2021).

¹¹³ See Patrick Kingsley, *Evictions in Jerusalem Become Focus of Israeli-Palestinian Conflict*, N.Y. TIMES (May 7, 2021), <https://www.nytimes.com/2021/05/07/world/middleeast/evictions-jerusalem-israeli-palestinian-conflict-protest.html> [<https://perma.cc/X2E6-VGT6>] (citing Israeli officials who claim that Palestinian authorities are “presenting a real-estate dispute between private parties as a nationalistic cause in order to incite violence in Jerusalem”).

¹¹⁴ See *id.* (offering the argument that Palestinian activists consider “the evictions [as] part of a wider strategy of reinforcing Jewish control over East Jerusalem”).

¹¹⁵ See *id.*; see also Dana El Kurd, *Young People Are Leading the Palestinian Protests in Jerusalem. And They Aren't Going Away*, WASH. POST (May 12, 2021), <https://www.washingtonpost.com/politics/2021/05/12/young-people-are-leading-palestinian-protests-israel-they-arent-going-away/> [<https://perma.cc/P55H-D2N8>].

¹¹⁶ El Kurd, *supra* note 115.

¹¹⁷ *Id.*

Aqsa), as protestors threw rocks at police forces, burned trash cans, and hurled burning tires and firebombs.¹¹⁸ Police responded with brutal force, firing rubber bullets and stun grenades at the protestors.¹¹⁹ On May 10, 2021, tensions rose further when clashes between Israeli police and protestors escalated, and Hamas responded by shooting rockets at Israel. Tor Wennesland, UN Special Coordinator for the Middle East Peace Process, briefed the SC on these developments:

On 10 May, amid heavy presence of Israeli security forces [“ISF”] ahead of the Israeli-organized Jerusalem Day march, thousands of Palestinians clashed with police in and around Jerusalem’s Old City. ISF reportedly shot and injured over 650 Palestinians with rubber-coated metal bullets and other crowd-control means. Thirty-two ISF personnel were injured.

Although Israeli authorities took steps to reduce tensions—including re-routing the march, postponing a Supreme Court hearing on the Sheikh Jarrah evictions and barring Jewish visits to the Holy Sites—the violence and heavy security presence continued. That very same day, Hamas fired seven rockets towards Jerusalem, causing some property damage and setting off the escalation of hostilities.¹²⁰

Israel’s then-Prime Minister Benjamin Netanyahu asserted that Israel considered the rocket attack to be an armed attack, thereby triggering its right to self-defense:

We are in a fight on several fronts: Jerusalem, Gaza and elsewhere in the country. This evening, on Jerusalem Day,

¹¹⁸ Toi Staff, *Arab Israeli Killed Amid Violent Riots by Arab Mob in Lod; Jewish Suspect Held*, TIMES OF ISR. (May 11, 2021), <https://www.timesofisrael.com/arab-israeli-man-killed-two-wounded-during-violent-protests-in-ramle> [<https://perma.cc/Y2SR-VP77>].

¹¹⁹ See Stephen Farrell & Rami Ayyub, *Israeli Police, Palestinians Clash at Jerusalem’s Al-Aqsa, Scores Injured*, REUTERS (May 7, 2021), <https://www.reuters.com/world/middle-east/thousands-pack-al-aqsa-mosque-protest-palestinian-evictions-jerusalem-2021-05-07/> [<https://perma.cc/AX3Y-JTDC>]; Bar Peleg, Josh Breiner & Yanal Jbareen, *Protests Spread to Major Israeli Arab Cities Amid Jerusalem Tensions, Violence*, HAARETZ (May 11, 2021), <https://www.haaretz.com/israel-news/premium-from-jaffa-to-sheikh-jarrah-israel-police-clash-with-protesters-against-evictions-1.9791282> [<https://perma.cc/HS8K-WGCG>].

¹²⁰ Tor Wennesland, U.N. Special Coordinator for the Middle East Peace Process, Security Council Briefing on the Situation in the Middle East, Including the Palestinian Question (May 27, 2021), <https://unsco.unmissions.org/security-council-briefing-situation-middle-east-including-palestinian-question-delivered-un-6> [<https://perma.cc/B3TS-TA33>].

the terrorist organizations in Gaza have crossed a red line and attacked us with missiles in the outskirts of Jerusalem.

Israel will respond with great force. We will not tolerate attacks on our territory, on our capital, on our citizens and on our soldiers. Whoever attacks us will pay a heavy price.¹²¹

As the conflict escalated, Hamas and affiliated forces relied heavily on rocket attacks, deploying them in ways to reduce the effectiveness of Iron Dome. In the eleven days of OGW, 4,360 rockets and mortar shells were fired at Israel (almost 400 attacks per day), which was “nearly four times the daily average number of launches during Operation Protective Edge (2014) or the Second Lebanon War (2006).”¹²² This increased rate of rocket attacks reflected a conscious Hamas strategy of mass launching barrages to overwhelm Iron Dome, a strategy that at times proved effective.¹²³ According to the Institute for National Security Studies, during OGW, “in quantitative terms the attacks from Gaza revealed a considerable improvement in the offensive capabilities of Hamas and Islamic Jihad in terms of the number of launches per day, the number of rocket barrages, the variety of munitions, and the destructive power of the short-range warheads.”¹²⁴

Despite Hamas’s evolution in strategy since 2014, Iron Dome still proved effective in 2021. IDF authorities maintain that Iron Dome’s success rate during OGW was 90%.¹²⁵ This success rate is similar to that of Iron Dome during the 2014 Gaza War, following considerable improvements to the system during the years between the two conflicts.¹²⁶

¹²¹ Press Release, Excerpt from PM Netanyahu’s Remarks at the Main Jerusalem Day Ceremony at Ammunition Hill, Israel Ministry of Foreign Aff. (May 10, 2021), <https://mfa.gov.il/MFA/PressRoom/2021/Pages/-PM-Netanyahu-s-remarks-at-the-main-Jerusalem-Day-ceremony-at-Ammunition-Hill-10-May-2021.aspx> [<https://perma.cc/N24K-JECP>].

¹²² Meir Elran et al., *Operation Guardian of the Walls: Lessons for the Civilian Front*, INST. FOR NAT’L SEC. STUD. (June 2, 2021), <https://www.inss.org.il/publication/guardian-of-the-walls-israeli-public/> [<https://perma.cc/JM2V-N89Z>].

¹²³ See Michael Starr, *Deadly Competition: The Iron Dome and the Gazan Rocket Race*, JERUSALEM POST (May 31, 2021), <https://www.jpost.com/arab-israeli-conflict/deadly-competition-the-iron-dome-and-the-gazan-rocket-race-669182> [<https://perma.cc/YA2B-9ULY>].

¹²⁴ Elran et al., *supra* note 122.

¹²⁵ *Id.*

¹²⁶ RAFAEL AIR DEF. SYS. LTD., *supra* note 103.

The simultaneous improvement from 2014 to 2021 of Israel's Iron Dome defensive capabilities and Hamas's offensive rocket capabilities reflect a "cat and mouse" game in the enduring asymmetric conflict that will likely persist. In 2014 and 2021, Iron Dome's overwhelming technological superiority has resulted in a significant casualty asymmetry between Israel and Palestine during conflict. However, this stark degree of asymmetry may be temporary, as Hamas and other anti-Israel combatants will continue to develop strategies and capabilities for overcoming Iron Dome's defenses. According to Frantzman, "[t]he message after the [2021] war is Israel's air defenses may one day not be enough to hinder volumes of rockets. Israel won't admit this, but there is a strategic peak for this [Iron Dome] technology."¹²⁷ Indeed, multiple rockets shot at the same time might challenge Iron Dome's capabilities. While for this round of fighting, the success rate remained similar, it is not clear how the race between Hamas's rockets and Iron Dome's defenses will end next time. Iron Dome may not always deliver a 90% success rate.

Just as in the 2014 Gaza War, states at the 2021 SC meeting agreed with Israel's right to self-defense in repelling rocket attacks on its territory along with a warning that use of force must be proportional.¹²⁸ As in 2014, diplomats expressed that the asymmetry of the parties was an important factor in determining whether Israel's use of force was just. For example, the representative of Saint Vincent and the Grenadines noted that "[t]he right to self-defence cannot cloak the wrongs of a party that fired the first shots and is using military capabilities far beyond that of the weaker party."¹²⁹

¹²⁷ Seth J. Frantzman, *Israel's Iron Dome Won't Last Forever*, FOREIGN POL'Y (June 3, 2021), <https://foreignpolicy.com/2021/06/03/israels-iron-dome-wont-last-forever/> [<https://perma.cc/Y7CN-Q8YN>].

¹²⁸ See Press Release, Security Council, Senseless Cycle of Bloodshed, Destruction Between Israel, Palestinians in Gaza Must Stop Now, Secretary-General Tells Security Council, U.N. Press Release SC/14521 (May 16, 2021) [hereinafter Security Council Press Release 14521]. In the press release, Simon Coveney, Minister for Foreign Affairs and Defence of Ireland, stressed that when acting in self-defense, Israel must protect civilians. The representative of Estonia noted, "Israel has a legitimate right for self-defence against such attacks, but must ensure proportionality of these actions." The UK representative offered, "while Israel has a right to self-defence, it must avoid civilian casualties." France's representative acknowledged Israel's right to self-defense in light of the rocket attack while also emphasizing its obligation to act with restraint. See also Press Release, General Assembly, Gaza Children Living in "Hell on Earth" Secretary-General Tells General Assembly, as Calls for End to Violence Crescendo, News of Israel-Hamas Ceasefire Breaks, U.N. Press Release GA/12325 (May 20, 2021).

¹²⁹ Security Council Press Release 14521, *supra* note 128.

While independent academic research and official reports have not yet been published about the 2021 conflict at the time of this writing, the immediate reaction in popular media indicates that this time too, casualty asymmetry negatively shapes public perception of the righteousness of Israel's actions. For example, in a *Last Week Tonight* monologue, John Oliver emphasized Iron Dome's interception capabilities in his discussion of Israel's use of force:

This isn't tit for tat. There is a massive imbalance when it comes to the two sides' weaponry and capabilities. While most of the rockets aimed toward Israeli citizens this week were intercepted, Israel's air strikes were not.¹³⁰

Trevor Noah also discussed how the high Palestinian death count, in comparison to the low Israeli death count due to Iron Dome's interception capabilities, affected his perception of whether Israel's actions were justified:

The part where we say who is good and who is bad—I'm not trying to do that. Let's step away from it, and instead ask a different question. Instead, let's look at who is dead and who is alive this week. . . . I cannot watch that footage and hear those numbers and see a fair fight. . . . [J]ust look at the technology alone. . . . [Israel has] one of the most advanced defense systems in the world. You shoot a rocket at them, it's probably not going to do anything to them If you are in a fight, where the other person cannot beat you, how hard should you retaliate when they try to hurt you?¹³¹

While neither John Oliver nor Trevor Noah are experts of international law, their criticisms of casualty asymmetry reflect the expressed sentiments of a wide range of diplomats, academics, and the media after the 2014 Gaza War. As Cannizzaro noted, the resort to quantitative proportionality is intuitive;¹³² it is triggered by a sense of discomfort from asymmetrical results of warfare, rather than by a nuanced understanding of *jus ad bellum* doctrine. Indeed, as Blank observed, media coverage of armed conflict often

¹³⁰ Devon Ivie, *John Oliver Has No Problem Accusing Israel of "War Crimes,"* VULTURE (May 17, 2021), <https://www.vulture.com/2021/05/john-oliver-israel-palestine-last-week-tonight.html> [<https://perma.cc/TCY6-NY88>].

¹³¹ The Daily Show with Trevor Noah, *Let's Talk About the Israel-Palestine Conflict*, YOUTUBE (May 11, 2021), <https://www.youtube.com/watch?v=NeZ4yXyzUG0> [<https://perma.cc/Y7KL-DPPL>].

¹³² See Cannizzaro, *supra* note 54, at 783.

influences professional legal analysis, as it shapes perceptions of who is right and wrong almost solely based on casualty numbers.¹³³ Therefore, the general public sentiment embracing a quantitative conception of *jus ad bellum* proportionality may very well appear in subsequent legal academic and professional work.

III. SHOULD A PARADIGM SHIFT BE EMBRACED?

A. *The Moral Dimensions of Quantitative Proportionality*

The examples provided in Part II reveal a shift from qualitative means-end proportionality to quantitative tit-for-tat proportionality arising from the extreme casualty asymmetry that Iron Dome creates. Such a change in perception does not reflect the mainstream understanding of proportionality in public international law doctrine. However, the overwhelming embrace of a tit-for-tat rationale when discussing *jus ad bellum* proportionality in relation to Iron Dome may suggest that this paradigm shift has arisen not from confusion or a misunderstanding of international law, but rather from a deliberate and intentional attempt to infuse proportionality analysis with morality. Indeed, asymmetrical warfare raises moral concerns. Kahn argued that “[i]f the fundamental principle of the morality of warfare is a right to exercise self-defense within the conditions of mutual imposition of risk, then the emergence of asymmetrical warfare represents a deep challenge.”¹³⁴ As use of AADS leads to extreme asymmetry, it undermines the concept of mutual imposition of risk,¹³⁵ and triggers a shift towards tit-for-tat proportionality that satisfies the biblical “eye for an eye” sense of justice. Indeed, Cannizzaro points out that “quantitative proportionality intuitively satisfies a sense of symmetry between attack and defence,” which aligns with the instinctual desire to focus on imbalances in asymmetrical conflicts.¹³⁶

The question of immorality in asymmetrical warfare does not imply that technological advancements should be avoided, which would not only be practically unrealistic but also would undermine development of

¹³³ See Laurie R. Blank, *A New Twist on an Old Story: Lawfare and the Mixing of Proportionalities*, 43 CASE W. RES. J. INT’L L. 707, 730–33 (2011).

¹³⁴ Paul W. Kahn, *The Paradox of Riskless Warfare*, 22 PHIL. & PUB. POL’Y Q. 2, 3 (2002).

¹³⁵ See *id.*

¹³⁶ Cannizzaro, *supra* note 54, at 783.

lifesaving technologies.¹³⁷ This is especially true for Iron Dome, which affects the death balance by saving Israeli lives, not by killing adversaries.

Thus, the question arising from the discomfort that the unbalanced death toll creates is not whether AADS should be abandoned; rather, it is whether such discomfort should be solved by altering the assessment of proportionality. While it may be intuitively desirable, the doctrine of quantitative proportionality has been replaced with that of qualitative proportionality for good reason (as will be demonstrated below), and is compatible with a modern view of using force as a means of self-defense, rather than of punishment or retribution.¹³⁸

In historical just war theory, war had a retributive aspect to it, and was considered to be a means of just punishment for wrongdoing.¹³⁹ In the sixteenth century, Cajetan asserted that war is not only justified in self-defense, “but also to exact revenge for injuries to itself or its members.”¹⁴⁰ Aquinas defined “just cause” to wage war as “required, namely that those who are attacked, should be attacked because they deserve it on account of some fault.”¹⁴¹ Grotius claimed that punishment is a just cause for war, arguing that “sovereign powers have a right not only to avert, but to punish wrongs.”¹⁴²

After World War I, the international community “turned away from this notion of war as justice, choosing instead to adopt a paradigm that allows defensive wars only, emphasizing peace and stability.”¹⁴³ The legal

¹³⁷ See, e.g., Strawser, *supra* note 13, at 359 (“But that would mean that this objection [to uninhabited aerial vehicles] could be used to block the development and implementation of any military technology that creates any asymmetry. Further, the objection could actually be employed to work backwards: that current militaries should intentionally reduce military capabilities in order to make war more costly to them since doing so would place their soldiers at greater risk. Following this logic could even lead to the conclusion that a state should have their militaries throw away their weaponry and all defensive technology, for certainly a neutered military would be less likely to engage in unjust wars in the future.”).

¹³⁸ See Enzo Cannizzaro, *Proportionality in the Law of Armed Conflict*, in THE OXFORD HANDBOOK OF INTERNATIONAL LAW IN ARMED CONFLICT 332, 345–46 (Andrew Clapham & Paola Gaeta eds., 2014).

¹³⁹ Blum, *supra* note 25, at 63.

¹⁴⁰ Thomas Cajetan, *Commentary to SUMMA THEOLOGIAE*, pt. II-II, question 40, art. 1 (1540), reprinted in THE ETHICS OF WAR: CLASSIC AND CONTEMPORARY READINGS 241, 242 (Gregory M. Reichberg et al. eds., 2006).

¹⁴¹ THOMAS AQUINAS, *SUMMA THEOLOGIAE*, pt. II-II, question 40, art. 1 (1485).

¹⁴² HUGO GROTIUS, *THE RIGHTS OF WAR AND PEACE* bk. II, ch. I, ¶ XVI (A.C. Campbell trans., M. Walter Dunne ed., rev. vol. 1901) (1625).

¹⁴³ Blum, *supra* note 139, at 63.

regulation of war after World War I in the post-war Treaty of Versailles and in the League of Nations Covenant was aimed at preventing war.¹⁴⁴ From that point on, the international community began to shape international law, and specifically the law of resorting to force, to prioritize preserving peace rather than realizing justice.¹⁴⁵ However, such efforts were not sufficient, as the horrors of World War II dashed hopes of world peace and stability after World War I. The aftermath of World War II caused the international community to realize that a preventive regime for the use of force is crucial, as “peace and security from war became the paramount interest of the new international order.”¹⁴⁶ Consequently, the UN was established to reflect the objective of international peace. The UN Charter declares that the UN's primary goal is to maintain peace and security.¹⁴⁷ The UN Charter provides that members states “shall settle their international disputes by peaceful means in such a manner that international peace and security, and justice, are not endangered.”¹⁴⁸

The UN's new order, and modern international law in general, shows “a strong overarching preference for peace and stability over justice in interstate relations.”¹⁴⁹ This shift has been driven by a belief “that a seemingly value-neutral prevention paradigm is more conducive to peaceful coexistence than the moral-laden concepts of punishment and retribution.”¹⁵⁰ Such preference of peace over justice in modern international law, in contrast to an earlier clear preference for justice over peace, is based not only on the desire to reduce violence but also on the modern understanding that peace is a condition for justice.¹⁵¹ Indeed, use of force as established in the UN charter is permitted as a means of self-defense, rather than of punishment or retribution as in the pre-charter era.¹⁵²

The modern emphasis on peace over retribution does not mean that, in practice, states' actions in self-defense are necessarily free of retributive

¹⁴⁴ *Id.* at 67; *see also* Treaty of Peace Between the Allied and Associated Powers and Germany arts. 231–47, June 28, 1919, 225 Consol. TS 137–59 [hereinafter Treaty of Versailles]; League of Nations Covenant art. 12.

¹⁴⁵ *See* Blum, *supra* note 139, at 67.

¹⁴⁶ *Id.* at 69.

¹⁴⁷ U.N. Charter art. 1, ¶ 1.

¹⁴⁸ U.N. Charter art. 2, ¶ 3.

¹⁴⁹ Blum, *supra* note 139, at 60.

¹⁵⁰ *Id.*

¹⁵¹ *See* Duane Bratt, *Peace over Justice: Developing a Framework for UN Peacekeeping Operations in Internal Conflicts*, 5 GLOB. GOVERNANCE 63, 77–78 (1999).

¹⁵² Cannizzaro, *supra* note 138, at 345–46; Cajetan, *supra* note 140, at 242.

considerations, which occur naturally when attacked.¹⁵³ Often, retributive motivations have political justifications, since governments of victim-states tend to believe that “public opinion demands a response to the armed attack even when it recognizes that such a response will serve no purpose other than retribution, and may even be counter-productive.”¹⁵⁴ Nevertheless, self-defense does not allow victim-states to use force with purely retributive motivation. While this motivation is often present, the main aim of an attack in self-defense must be to halt and repel an attack, or arguably to prevent an upcoming attack.¹⁵⁵ Therefore, actions taken in self-defense cannot “purport to serve as punitive action against the aggressor.”¹⁵⁶

Adopting standards of quantitative proportionality would potentially allow for the use of punishment in response to attacks, instead of simply taking action to repel an attack. If punitive rather than defensive actions are permitted, the differentiation between reprisal and self-defense collapses, undermining the contemporary theory of the use of force in self-defense.¹⁵⁷

A paradigm shift toward quantitative proportionality may undermine the reduction in violence that critics of Israel’s operation in the 2014 Gaza War seek. Regression to quantitative proportionality and a tit-for-tat approach would imply that states may attack to punish and retaliate, even if such response would exceed the force necessary to halt the attack. As Lieblich pointed out, “[t]he quantitative approach . . . could be both too permissive and too restrictive in relation to the just defensive cause.”¹⁵⁸ To demonstrate this claim, Lieblich used an example of an attack by a single rocket launcher that launches dozens of rockets.¹⁵⁹ Lieblich argued that a quantitative test would allow the attacked state to launch a counterattack equivalent in its scope to that of dozens of rockets, while it could more effectively repel the attack and minimize casualties by eliminating the launcher with a single missile.¹⁶⁰

¹⁵³ See DINSTEIN, *supra* note 60, at 199.

¹⁵⁴ Kretzmer, *supra* note 36, at 268.

¹⁵⁵ See *id.*

¹⁵⁶ Theodora Christodoulidou & Kalliopi Chainoglou, *The Principle of Proportionality from a Jus ad Bellum Perspective*, in THE OXFORD HANDBOOK OF THE USE OF FORCE IN INTERNATIONAL LAW 1187, 1197 (Marc Weller ed., 2015).

¹⁵⁷ See Kretzmer, *supra* note 36, at 254.

¹⁵⁸ Lieblich, *supra* note 59, at 64.

¹⁵⁹ See *id.* at 64 n.98.

¹⁶⁰ *Id.* Lieblich explains that the quantitative approach can be too restrictive as well. He offers an example of a well-entrenched mortar that would require multiple bunker-busting bombs to destroy. A quantitative approach might see such use of power as excessive. *Id.*

Therefore, this author suggests that scholars, states, and commentators should be aware of possible biases when estimating proportionality in conflicts involving AADS. When performing such assessments, it is necessary to stay within the boundaries of qualitative proportionality and to avoid the temptation of taking a tit-for-tat approach. Awareness of such a phenomenon is a critical step in addressing it.

B. Relevance of Death Toll to Qualitative Proportionality

Whether one endorses the perception that the purpose of force in self-defense is merely to halt and repel an attack, or that it may include the deterrence and prevention of future attacks, the balance of casualties is not a component in a traditional qualitative assessment of proportionality.¹⁶¹ However, an argument in favor of including casualty imbalance in the assessment of proportionality may arise if the narrow test of proportionality accompanies the means–end evaluation. From this approach, once the means–ends test has been satisfied, it is necessary to assess “whether the forcible means used were necessary in light of the legitimate ends of self-defence in the particular case,”¹⁶² or, more simply, “whether the harm caused by those necessary means outweigh[ed] the expected benefits.”¹⁶³ The absence of casualties on one side compared with the multiple casualties on the other may lead to the conclusion that the actions taken in self-defense were not proportional, even if they satisfied the initial means–end criteria. In some situations, the benefits of halting an attack that would have resulted in casualties do not outweigh the tremendous damage caused by the actions taken for such a purpose.

However, this analysis is overly simplistic, as AADS does not completely negate the damage of an attack or prevent a state from having to repel it. First, AADS will not necessarily protect civilians indefinitely. Technology, by its nature, is bound to be outsmarted. For example, while the protection that Iron Dome bestows was considered near perfect in 2014, Hamas developed strategies and capabilities to exploit Iron Dome’s weaknesses. For example, Hamas learned that Iron Dome has gaps in its coverage, especially for short-range rockets threatening communities near the border.¹⁶⁴ In OGW, the escalation in 2021, Hamas further improved its

¹⁶¹ See generally Stéphanie Bellier, *Unilateral and Multilateral Preventive Self-Defense*, 58 ME.L. REV. 507 (2006).

¹⁶² Kretzmer, *supra* note 36, at 240. Note that Kretzmer himself does not endorse this approach. See *id.* at 282.

¹⁶³ *Id.* at 240.

¹⁶⁴ Jaffe-Hoffman, *supra* note 102.

tactics to counter Iron Dome.¹⁶⁵ While the interception percentage in 2021 remained similar to that in 2014, such similarity reflected Hamas's understanding of the system and its weaknesses, as Iron Dome underwent extensive improvements between the conflicts.

Second, although AADS can prevent casualties, its use does not completely protect the civilian population from physical and psychological harm. Detecting a missile launched at a civilian population triggers an alarm, and, depending on the proximity of the community to the border, civilians are expected to reach shelter or a safe place in a matter of seconds.¹⁶⁶ For example, civilians living in residential communities close to the Gaza Strip have 15 seconds or fewer to seek shelter.¹⁶⁷ Nearly a million Israelis have less than a minute to reach shelter before a rocket explodes.¹⁶⁸ Shelter is necessary in the event that Iron Dome fails to intercept the rocket or to protect against the danger of debris if it successfully intercepts a rocket.¹⁶⁹ Therefore, the IDF advises civilians to take cover for at least ten minutes after an alarm has been triggered to avoid falling debris and shrapnel.¹⁷⁰ The constant wail of sirens; the extensive damage to homes, infrastructure and agriculture; the economic harm; and the psychological trauma have taken an enormous toll on Israel's population.¹⁷¹ The lack of casualties does not imply an absolute lack of harm. Therefore, the use of AADS as a defensive measure should not replace the need to preempt rocket and missile attacks.

Third, even if AADS could provide hermetic protection without fail, and even if the negative psychological and economic effects of rocket attacks could be mitigated, the exorbitant price of AADS precludes its sustained use. A single Iron Dome battery costs between \$50,000,000 and \$80,000,000, and each interceptor costs between \$50,000 and \$100,000.¹⁷² The cost to use Iron Dome during the 2014 war was estimated at \$1,000,000

¹⁶⁵ See *supra* Part II.

¹⁶⁶ STATE OF ISRAEL, *supra* note 15, at xii.

¹⁶⁷ *Id.*

¹⁶⁸ *Id.* at 27.

¹⁶⁹ *Id.* at 62.

¹⁷⁰ *Id.* at 108.

¹⁷¹ *Id.* at 1.

¹⁷² Richemond-Barak & Feinberg, *supra* note 14, at 504 n.151; Inna Lazareva, *The Iron Dome: What Is It and How Does It Work?*, THE TELEGRAPH (July 10, 2014), <http://www.telegraph.co.uk/news/worldnews/middleeast/israel/10960091/The-Iron-Dome-what-is-it-and-how-does-it-work.html> [https://perma.cc/89X6-5VCF]; Yuval Azulai, *Iron Dome: 8 Facts About the True Queen of Strong Cliff*, GLOBES (July 10, 2014), <https://www.globes.co.il/news/article.aspx?did=1000953639> [https://perma.cc/X9ZT-LCMT].

per fighting day (over a month-long conflict).¹⁷³ In contrast, the cost of each Hamas missile launched at Israel was sometimes as low as a few hundred dollars.¹⁷⁴ With such a disproportionate cost ratio, it is fiscally infeasible for AADS to support a long-term armed conflict. AADS function as temporary protective measures until launches are repelled, rather than as permanent solutions to continuous shelling.

While the impact of AADS on the assessment of proportionality may be justifiable from the narrow proportionality perspective, it can only diminish the harms that attacks cause, not eliminate them. Regardless of how sophisticated they are, AADS have the potential to fail or be outmaneuvered; they place heavy constraints on people's lives; and their exorbitant costs preclude their sustained use. The use of AADS may affect the outcome of the narrow proportionality test, but the test has not been subject to significant academic analysis, let alone wide consideration.¹⁷⁵ If the international community eventually adopts such a doctrine, then use of AADS will affect assessments of proportionality. However, as the narrow proportionality test has not yet been endorsed in *jus ad bellum*, the use of AADS should not affect qualitative proportionality.

C. A Shift to Quantitative Proportionality Erodes the Distinction Between Jus Ad Bellum and Jus in Bello

The shift towards quantitative proportionality in cases of extreme asymmetry and the reference to aftermath casualty balance to assess *jus ad bellum* proportionality blur the lines between *jus ad bellum* and *jus in bello*. While just war theory subordinated *jus in bello* to *jus ad bellum* considerations, modern international law provides that "international humanitarian law binds all belligerents, regardless of who is the aggressor" and that *jus ad bellum* and *jus in bello* are two separate systems.¹⁷⁶ Indeed, the dominant position today is that the legality of use of force in *jus ad*

¹⁷³ Ben Sales, *How Much Has Israel's War Against Hamas Cost?*, TIMES OF ISR. (Aug. 12, 2014), <https://www.timesofisrael.com/how-much-has-israels-war-in-gaza-cost/> [https://perma.cc/83NG-6YHW].

¹⁷⁴ Azulai, *supra* note 172.

¹⁷⁵ Kretzmer, *supra* note 36, at 240 ("Many experts assume that it is only relevant in *jus in bello*."); *id.* at 278–79 ("Issues of 'narrow proportionality' in *jus ad bellum* have not been subjected to much academic analysis, and the impression is that many experts assume that whether the means were necessary to achieve the legitimate ends is the be-all and end-all of proportionality in *jus ad bellum*."). In fact, this author did not manage to find support for the narrow proportionality test in *jus ad bellum* in other sources other than Kretzmer's EJIL article cited above.

¹⁷⁶ Moussa, *supra* note 11, at 964.

bellum does not affect the equal application of international humanitarian law (“IHL”), as the two frameworks stand independently.¹⁷⁷ The motivation for the distinction and separation between *jus ad bellum* and *jus in bello* is that the lack of such separation would allow states to “justify all departures from *jus in bello* with reference to the purported justness of their cause. The result: an invitation to unrestricted warfare.”¹⁷⁸ Therefore, the very effectiveness of IHL depends on the separation between the two bodies of law.¹⁷⁹

The erosion of the separation between the two systems has been most notably introduced in the *Advisory Opinion on the Threat or Use of Nuclear Weapons*, where the International Court of Justice (“ICJ”) asserted that there might be an exception of “extreme circumstance of self-defence” that allows states to violate IHL, thus subordinating *jus in bello* to *jus ad bellum* in such circumstances.¹⁸⁰ In the case of *Prosecutor v. Fofana & Kondewa* before the Special Court for Sierra Leone, the Trial Chamber reduced the sentences of two leaders of the Civil Defence Forces because, despite committing atrocities, they fought for “a cause that is palpably just and defensible.”¹⁸¹ However, the Appeals Chamber rejected this disregard of the distinction between *jus ad bellum* and *jus in bello*, stressing that the separation between *jus ad bellum* and *jus in bello* is “a bedrock principle” of international law.¹⁸²

In academia, there has been further debate regarding whether in some circumstances, the legality of use of force should affect the applicability of IHL. Frowe and McMahan have argued against the distinction between *jus ad bellum* and *jus in bello* from a moral perspective,

¹⁷⁷ MICHAEL WALZER, *JUST AND UNJUST WARS: A MORAL ARGUMENT WITH HISTORICAL ILLUSTRATIONS* 21 (4th ed. 2006).

¹⁷⁸ Blank, *supra* note 133, at 721.

¹⁷⁹ *Id.*

¹⁸⁰ Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226, ¶ 105 (July 8) (“[I]n view of the current state of international law, and of the elements of fact at its disposal, the Court cannot conclude definitively whether the threat or use of nuclear weapons would be lawful or unlawful in an extreme circumstance of self-defence, in which the very survival of a State would be at stake.”).

¹⁸¹ *Prosecutor v. Fofana*, Case No. SCSL-04-14-T, Sentencing Judgment, ¶ 86 (Oct. 9, 2007), <https://www.refworld.org/cases,SCSL,46e123dc2.html> [<https://perma.cc/U8TN-W3RS>]; see also Blank, *supra* note 133, at 719–20.

¹⁸² *Prosecutor v. Fofana*, Case No. SCSL-04-14-A, Appeal Judgment, ¶¶ 530–31 (May 28, 2008), <http://www.rscsl.org/Documents/Decisions/CDF/Appeal/829/SCSL-04-14-A-829.pdf> [<https://perma.cc/XD57-3HYM>].

positing that the legality of use of force in *jus ad bellum* should affect the applicability of IHL.¹⁸³

Raphaël van Steenberghe noted how an asymmetry in casualty balance leads to an eroding distinction between a *jus ad bellum* and *jus in bello* assessment of proportionality, and argued that the asymmetry in the 2006 Lebanon War led states to criticize Israel over its *ad bellum* lack of proportionality due to *in bello* behavior:

The Israeli intervention in Lebanon in 2006 is mentioned as a typical precedent evidencing such interrelations, since—as argued by scholars—many states considered that the Israeli intervention was disproportionate in light of the law of self-defence—and, therefore, not justified—because of the excessive damage caused to civilians and civilian infrastructure. In addition, reasons given by states in order to justify the evaluation as disproportionate of the Israeli intervention under *jus ad bellum* were similar to those advanced by the same or other states in order to explain the evaluation as disproportionate of the intervention under *jus in bello*. In fact, practice shows that states have frequently criticised the disproportionate nature of the self-defence action by emphasising the excessive damage caused by this action to the civilian population.¹⁸⁴

There was less casualty asymmetry in the 2006 Lebanon War than there was in the 2014 Gaza War. In 2006, Israel lost 119 soldiers and 44 civilians,¹⁸⁵ while Lebanon sustained 1,109 casualties, at least 499 of whom

¹⁸³ Helen Frowe, *The Just War Framework*, in THE OXFORD HANDBOOK OF ETHICS OF WAR 1, 3 (Seth Lazar & Helen Frowe eds., 2018) (“If this asymmetry obtains in war, we must reject the thesis of moralequality between combatants. This entails a rejection of one aspect of the bifurcation of war: if just cause matters for the status of combatants, it cannot be true that *ad bellum* and *in bello* judgments are, as Walzer claims, ‘logically independent’ of each other.”); see generally Jeff McMahan, *The Morality of War and the Law of War*, in JUST AND UNJUST WARRIORS: THE MORAL AND LEGAL STATUS OF SOLDIERS 19, 19–43 (David Rodin & Henry Shue eds., 2008). Please note that both Frowe and McMahan make their assertion from a moral perspective, and do not necessarily aim to incorporate such notions in positive law.

¹⁸⁴ van Steenberghe, *supra* note 63, at 110–11.

¹⁸⁵ Gil Merom, *The Second Lebanon War: Democratic Lessons Imperfectly Applied*, 4 DEMOCRACY AND SEC. 5, 12 (2008).

were civilians.¹⁸⁶ As a result, in terms of confirmed civilian casualties, in 2006 there were 44 Israelis and 499 Lebanese, while in 2014 there were 6 Israelis and 1,462 Palestinians.¹⁸⁷ As discussed in Part II above, AADS played a major part in reducing civilian casualties during the 2014 Gaza War as well as in OGW. Therefore, it is not surprising that the tendency to blur the lines between *jus as bellum* and *jus in bello*, which occurred in 2006,¹⁸⁸ became particularly apparent after the extreme asymmetry of 2014.

CONCLUSION

AADS exacerbates asymmetry in warfare. Its use has dramatically reduced casualties on one side, even when that side is subject to sustained rocket and missile attacks. When a state that employs AADS must also resort to the use of preemptive force in self-defense, asymmetric casualty counts arise, exposing the state to criticism of disproportionality. Definitions of *jus ad bellum* proportionality in academic literature typically do not rely on casualty symmetry, instead focusing more holistically on a qualitative, means-end assessment. However, the public, the media, politicians, states, and some scholars often assume that the considerable contrast between the few casualties on the defensive side resulting from the use of AADS and the many casualties caused by the defending state's actions indicate a lack of proportionality. This use of quantitative proportionality, which arises from an intuitive attraction to symmetry or a biblical "eye for an eye" sense of justice, is understandable. Asymmetrical warfare raises concerns of immorality, and AADS aggravates that asymmetry. However, a paradigm shift towards quantitative proportionality poses substantial risks to international peace and security.

The tit-for-tat approach, which is based on a rationale of revenge rather than self-defense, is contradictory to the central purpose of modern international law. It may serve a sense of moral symmetry, but it endangers the core perception of use of force in international law and may threaten values of peace and security. In means-end proportionality, the unequal body count becomes relevant only if the narrow quantitative proportionality analysis is encompassed in a broader qualitative test. In such a case, the

¹⁸⁶ HUMAN RIGHTS WATCH, WHY THEY DIED: CIVILIAN CASUALTIES IN LEBANON DURING THE 2006 WAR 4, 6 (Sept. 5, 2007), <https://www.hrw.org/report/2007/09/05/why-they-died/civilian-casualties-lebanon-during-2006-war> [<https://perma.cc/9R2C-TJGE>].

¹⁸⁷ Indep. Comm'n of Inquiry, *supra* note 15, at 20, 153. *But see* STATE OF ISRAEL, *supra* note 15, at xii, 112–13. Israel asserts that 761 of the Lebanese casualties were civilian rather than 1,462. *Id.*

¹⁸⁸ van Steenberghe, *supra* note 63, at 110–11.

damages that self-defense actions cause may dilute the benefits (e.g., reduced casualties) of such actions, tilting the scales toward lack of proportionality. The narrow proportionality test has not yet been broadly accepted as a component of the *jus ad bellum* assessment of proportionality and has been given little consideration.¹⁸⁹ Furthermore, the consideration of casualty imbalance to determine *jus ad bellum* proportionality impairs the distinction between *jus ad bellum* and *jus in bello*, opening the door to international actors justifying atrocities in the name of righteousness, or otherwise discouraging states that are criticized for their *ad bellum* complaints from fulfilling their *in bello* obligations. Maintaining the *ad bellum/in bello* distinction is critical to ensuring compliance with this longstanding principle of international law.

If one agrees that qualitative means-end proportionality should be the method of analyzing proportionality in conflicts involving AADS, that a shift to quantitative proportionality is not desirable, and that the *jus ad bellum/in bello* distinction should be maintained, then one must be aware of the common biases that shape public and academic discussion concerning proportionality when AADS are employed. Recognizing and discussing such biases may reduce the unintentional shift to quantitative proportionality. Analysis of proportionality based on bias or misconceptions of international law is problematic not only because it is inaccurate, but also more importantly, it deflects the discussion from a relevant and accurate assessment of proportionality. If the discourse on proportionality during the modern Israeli-Palestinian conflict continues to focus primarily on quantitative proportionality, it deflects from serious discussion of whether Israel acted with means-end proportionality. Indeed, Israeli authorities have often engaged in “educating” the media and states regarding what the principle of proportionality entails, rather than addressing the issue of whether Israel had complied with the principle of proportionality as international law requires.¹⁹⁰ The assertion based on the tit-for-tat perception that Israel did not comply with proportionality requirements can be easily disregarded by addressing this assessment’s lack of validity. However, a serious debate on proportionality that is not affected by body count bias would lead to a more in-depth analysis of the legality of state actions.

¹⁸⁹ See Kretzmer, *supra* note 36, at 278.

¹⁹⁰ See Zeke J. Miller, *supra* note 89; Hilik Bar, *How Many Israelis Must Die Before We Are “Allowed” to Defend Them?* GUARDIAN (July 20, 2014), <https://www.theguardian.com/commentisfree/2014/jul/20/israelis-die-defend-british-media> [<https://perma.cc/TD37-NB3B>].

While this research focuses on Iron Dome's effect on the assessment of proportionality, the analysis may become relevant in more conflicts around the world with the growing use of AADS. Asymmetry between adversaries increasingly characterizes modern warfare.¹⁹¹ New technologies that powerful states employ are one of the main contributors to such asymmetry.¹⁹² It is safe to say that AADS are here to stay. Thus, this Article's findings on Iron Dome's use, the resulting casualty imbalance, and its implications for the definition of *jus ad bellum* proportionality can be applied to additional situations involving asymmetrical warfare, such as a future operational use of AADS.

Whether one believes that extreme asymmetry justifies a drift towards quantitative proportionality, or instead views the narrow proportionality test as an important legal concept in *jus ad bellum*, non-mainstream legal concepts like quantitative proportionality should be used carefully after discussing and assessing their validity and consequences. Today, the use of AADS affects discussion regarding *jus ad bellum* proportionality, but the effect of AADS has not been sufficiently acknowledged or addressed. Therefore, scholars should continue to shed light on the paradigm shift in *jus ad bellum* proportionality due to the use of AADS to inspire discussion on a topic that may greatly influence how armed conflicts will be fought in the future.

¹⁹¹ Blank, *supra* note 4, at 355.

¹⁹² See Schmitt, *supra* note 7, at 7–8.