A Theory of the Laws of War

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The laws of war govern the weapons and tactics used by militaries during times of war. These laws, like other international laws, are not enforced by a central authority, but have force, if they do, only to the extent that nations either retaliate against belligerents who violate them or treat the laws of war as interior constraints. Whether the laws of war do have such force is a question that has not been answered. States frequently violate the laws of war, and when they do not, it is often because the laws have minimal, and controversial, content.[1] But states do take trouble because of these laws: They take the trouble to negotiate the laws of war during interwar conferences, and they take the trouble to argue during war that their behavior does not violate the laws of war. Putting aside the issue of how much the laws of war influence the behavior of states, a question of interest is why the laws of war have their particular content: why nations have agreed to the existing rules rather than some alternative set of rules. This question is the focus of this Essay.

I will argue that the laws of war are best understood as devices for limiting the efficiency of military technology, understood broadly to include weapons and tactics that enjoy a high ratio of predatory impact to cost. The lower the level of military technology, the less wealth that nations will invest in conflict, and the more they will invest in production and consumption. However, the influence of the laws of war, and the ability of nations to agree on restrictive laws of war, are constrained by many factors, including the asymmetry of national resources and the value of destructive weapons for deterring predation. The laws have a rationale, but their content and influence are likely to be limited.

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1 See generally Geoffrey Best, *War and Law Since 1945* (Clarendon 1994); Geoffrey Best, *Humanity in Warfare* (Columbia 1980). See also the essays in Michael Howard, George J. Andreopoulos, and Mark R. Shulman, eds, *The Laws of War: Constraints on Warfare in the Western World* (Yale 1994).

I. THE LAWS OF WAR: AN OVERVIEW

The laws of war were, prior to the twentieth century, part of customary international law. The Hague Conferences of 1899 and 1907 were the first significant, multilateral efforts to establish laws of war by treaty, and there have been many more such efforts since then. The laws of war can be divided into general principles and specific prohibitions.[2] The necessity principle holds that the amount of suffering caused by a weapon (in the form of death, serious injuries, and so forth) should not be more than necessary to achieve a legitimate military aim. The discrimination principle holds that civilians should not be targeted, and the proportionality principle holds that collateral damage to them and their property should be limited.

The principles are most easily understood in their application to specific prohibitions. The necessity principle is illustrated by the distinction between dumdum bullets, which are proscribed, and explosive shells, which are permitted. Both cause severe wounds compared to those caused by ordinary bullets, but the explosive shells also disable or kill more soldiers. For a given level of suffering, the explosive shell obtains a larger military objective. To be sure, one might quarrel with both claims, and argue that dumdum bullets are more effective than explosives and ordinary bullets when the military objective is to stop enemy soldiers without destroying nearby structures or civilians, but the basic idea is clear.

The proportionality principle would likely forbid area bombing of cities such as that which occurred during World War II, which was intended to kill and demoralize civilians. The recent American strategy of bombing targets from high altitudes so that pilots are invulnerable to anti-aircraft fire provides a more controversial example. Some have argued that the strategy produces too many civilian deaths for a given military objective, and that the proportionality principle requires American pilots to risk their lives and fly at lower altitudes in order to reduce the harm to civilians.[3]

Also interesting, but not squarely following from the principles, is a rule against perfidy, which forbids soldiers to wear the uniforms of enemies, to call a truce in order to lure the enemy into the open where they will be attacked, to disguise a warship as a hospital ship, and so forth. Deception during war is not prohibited. One can trick the en-

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[2] This summary is based on Christopher Greenwood, *The Law of Weaponry at the Start of the New Millennium*, in Michael N. Schmitt and Leslie C. Green, eds, *The Law of Armed Conflict: Into the Next Millennium* 185, 194–212 (Naval War College 1998).

[3] See, for example, Amnesty International, *"Collateral Damage" or Unlawful Killings? Violations of the Laws of War by NATO During Operation Allied Force* 13–16 (June 2000).

emy into thinking that one's army is at point A rather than point B. The prohibition extends only to deception that involves the manipulation of international law.

There are many other principles and prohibitions, including a great many maritime rules of an analogous nature, and more detailed rules contained in the Geneva Conventions and subsequent international court opinions. But those that have been mentioned serve to convey the general sense of the laws of war.

II. THE HUMANITARIAN VIEW

The conventional explanation for the laws of war is that they serve humanitarian values, but it is hard to find a detailed defense of this position. The necessity and discrimination principles are usually identified with the humanitarian premise, as if they logically followed, but the relationship between the principles and the core value is ambiguous. Killing and demoralizing civilians and soldiers, and destroying civilian transportation and communications networks and other property, have always been tactics in warfare, often justified by long-term humanitarian goals—the desire to end a war sooner rather than later—that cannot be accomplished, it is thought, through limited war. Area, including nuclear, bombing during World War II is just the most famous example. Destructive weapons and tactics might also serve humanitarian values by making war an unattractive option for pursuing political ends. This is the theory of nuclear deterrence during the Cold War and after.[4]

The other principles and rules of war have an even weaker relationship to humanitarian values. The rules against perfidy are said to reflect "chivalric values."[5] The prohibition of highly expensive weap-

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[4] See Paul Kennedy and George J. Andreopoulos, *The Laws of War: Some Concluding Reflections*, in Howard, Andreopoulos, and Shulman, eds, *The Laws of War* 214, 217 (cited in note 1) (discussing arguments that exemplary violence may in some cases be considered humane). See also Best, *Humanity in Warfare* at 13 (cited in note 1) (similar). Compare Michael Walzer, *Just and Unjust Wars* 130–33 (Basic 1977) (rejecting this argument). Nuclear weapons have not been subject to specific prohibitions but they potentially run afoul of the proportionality principle, depending on their use. See *Legality of the Threat or Use of Nuclear Weapons*, 1996 ICJ 226, 245:

> The proportionality principle may thus not in itself exclude the use of nuclear weapons in self-defence in all circumstances. But at the same time, a use of force that is proportionate under the law of self-defence, must, in order to be lawful, also meet the requirements of the law applicable in armed conflict which comprise in particular the principles and rules of humanitarian law.

[5] See Theodor Meron, *The Humanization of Humanitarian Law*, 94 Am J Intl L 239, 242–243 (2000) (describing the traditional influence that notions of chivalry have had on the development of the laws of armed conflict); Greenwood, *Law of Weaponry* at 190 (cited in note 2) (suggesting that the prohibition of perfidy serves both humanitarian and chivalric ends).

ons, a goal of some of the parties to the Hague Conferences, appears to be based on the object of making war less costly, not necessarily of saving lives and property during wars.[6] The rules also reflect "deep-seated taboos" like the taboo against fire, and "self-interest," such as the desire to preserve a military advantage (like Britain's navy) against a new technology (submarines).[7] Or so holds the standard wisdom. But this hodgepodge is not satisfactory, and a more parsimonious explanation is needed.

III. A THEORY

A. A Simple Case Involving Equal States

Imagine two states ($i = 1, 2$) that start with equal resources (r_i) and then invest them either in productive capital (e_i) or military capital (f_i).[8] Productive capital produces goods for domestic consumption; military capital produces appropriative capacity—the ability to extract a share of the other state's resources. Each state knows that the other state will divide its resources between production and predation; there is full information.

The efficiency with which resources are converted into productive or military capital depends on the productive and military technologies. Keeping things simple, we will assume a simple productive technology where one unit of production produces one unit of income. Think of the two states jointly producing an income (y) equal to the sum of their respective investments in productive capital ($y = e_1 + e_2$). This joint income is, in effect, a common pool from which each state extracts a share through its investment in military capital. Each unit of investment in military capital increases the investing state's share of the joint income, holding constant the other state's investment. If each state invests an equal amount, each obtains half of the joint income; if

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6 See Greenwood, *Law of Weaponry* at 190 (cited in note 2) (describing Russia as "being particularly concerned to ensure that limits were placed on the introduction of new weapons and the consequent increases in military expenditure which these would entail").

7 See id at 191 (describing how weapons that violate taboos or that are new often are treated as being particularly barbaric).

8 I rely on a simplified version of Hirshleifer's conflict model here and throughout, and the reader should consult his discussion for assumptions, limitations, and so forth. See Jack Hirshleifer, *The Paradox of Power*, in Jack Hirshleifer, *The Dark Side of the Force: Economic Foundations of Conflict Theory* 43, 63–64 (Cambridge 2001). I do not discuss production technology and thus assume that in his model the production technology variable s = 1. For a related model, see Herschel I. Grossman and Minseong Kim, *Swords or Plowshares? A Theory of the Security of Claims to Property*, 103 J Polit Econ 1275, 1287 (1995) (discussing the relationship between security of claims to property and economic well-being, and arguing that poorer states may benefit where claims to property are less secure).

one state invests more than the other, then the first state's share is larger than one half. The military technology, $m > 0$, is a variable that changes as a result of technological and strategic innovation. As military technology becomes more efficient, a state that invests one additional unit in military capital will obtain a larger share of the joint income, holding constant the other state's investment in military capital.[9]

The jointly optimal outcome occurs if both states invest all their resources in production and none in predation. They produce the maximum output and divide it evenly.[10] The problem is that each state has an incentive to invest in predation as well. If state j invests 0 in its military, then state i can obtain all of the joint income by investing a small amount in its military. Because state j has the same incentive, both states will invest a positive amount in their militaries. Further, because each state expects the other to engage in some predation, the first state does not expect to obtain the full marginal dollar of its investment in productive capital; this creates an additional incentive to move resources from production to predation. On the other hand, neither state will invest all of its resources in military capital, for then at the margin it will obtain relatively little or nothing from the other state while foregoing the opportunity to produce goods and keep a share of them.

In equilibrium each state will invest equal, positive amounts in both military and productive capital. What is more interesting, for our purposes, is that the states will invest more in military capital as the military technology becomes more efficient (holding constant productive efficiency). The reason is that with greater efficiency, the predatory returns generated by an additional dollar invested in military capital will be greater than the share of productive returns generated by an additional dollar invested in productive capacity. But because both states invest more in predation, they become jointly worse off. Thus, the prisoner's-dilemma-like logic of the game forces the states to impose greater joint costs on each other as military technology becomes more efficient.

The states will be better off if they can jointly limit (1) investment in military capital, or (2) the efficiency of military technology. The first goal is generally reflected in arms limitation agreements and is not of

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9 A state's share $p_i = f_i^m / (f_i^m + f_2^m)$. Thus, each state's utility function is $p_i y$, subject to $r_i = e_i + f_i$.

10 For now, I assume that each state wants to maximize consumption; a common assumption among realists is that states care about relative position. I will later discuss the realist position. See text accompanying note 22.

concern here. The second goal suggests a hypothesis for the laws of war: They are designed to limit the efficiency of military technology.

This hypothesis sheds light both on the general standards and specific rules. The necessity principle, by requiring states to use weapons and tactics that do not cause too much harm given a military objective, forces the state to use less powerful or destructive weapons. By reducing the options available to commanders, the principle reduces the capacity of a unit of military investment to inflict harm on the enemy. The same is true for the discrimination principle, which requires a military force to *take losses* rather than inflict too much harm on civilians and civilian property. The discrimination principle thus increases the cost of achieving a given objective, that is, increasing one's share of the joint income.

Rules prohibiting poison gas, the execution of prisoners, the laying of untethered mines at sea, and many other activities exhibit a similar logic. Poison gas can be cheap and effective; prisoners are costs when conditions prevent their use as hostages or workers;[11] untethered mines are cheaper than tethered mines; and so forth. Also consistent with the hypothesis are recurrent (but usually unsuccessful) efforts to restrict the use of new, highly effective weapons—the crossbow, submarines, and nuclear devices.

The rules against perfidy can also be understood from this perspective. Perfidy—for example, displaying the white flag but then firing on enemy forces as they approach—is a highly effective tactic, in the sense that it enables a weaker force to inflict losses on a stronger force by luring the latter into the open. Of course, once one side uses this tactic, the other side will not trust it, but we must assume that the first side takes the costs into account. The rules against perfidy remove an option that is sometimes effective, thus driving up the cost of military operations.

The laws relating to neutrality are designed to make clear the ways that belligerents will treat neutrals. Belligerents generally want expansive rights—they want to be able to stop neutral ships and search for, and seize, materials being shipped to the enemy; they also want to blockade enemy ports. Although belligerents also fear that if they treat neutrals too roughly these states will enter the war on the other side, they will balance this cost against the benefit. If laws of

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[11] For discussions of this argument, see Richard A. Posner, *Some Economics of International Law: Comment on Conference Papers*, 31 J Legal Stud S321, S325 (2002) (discussing the costs associated with keeping prisoners of war and noting that these costs are negligible); James D. Morrow, *The Institutional Features of the Prisoners of War Treaties*, 55 Intl Org 971, 979 (2001) (discussing the cost of maintaining treatment standards required by POW conventions).

neutrality are constraining, then they again take an effective tactic from the hands of the belligerent. (It is conceivable that strong neutral rights should be counted as the effective weapon—for example, if enemies transport spies and saboteurs via neutral vessels. But the history of the laws of war suggest otherwise: that being able to stop, block, or sink neutral ships was an important freedom for belligerents.)

The main barrier to empirical verification of the model is the difficulty of distinguishing between efficient and inefficient technology. There is much debate, for example, about whether poison gas is efficient or inefficient; apparently efficient technologies like laser-guided bombing are in fact not efficient if they are too costly. Still, the "technology limitation" hypothesis has enough support to be considered a legitimate rival to the ill-defined humanitarian view. It implies that laws of war will be directed foremost at the most efficient weapons (that is, weapons with the highest ratio of military effectiveness to cost, and thus not necessarily the most expensive weapons). It also implies that states would ban all weapons if they could; but we will see why they do not go that far in the next two Parts.

B. Unequal States

Suppose now that state i starts with more resources than state j. Some of the basic results of the original analysis continue to hold: Each state will invest some amount in military capital and as a result neither is as well off as it would be if both invested solely in productive capital. However, with unequal resources there is a twist.

Suppose that the military technology is below some threshold m^*. Despite its greater wealth, state i will invest the same amount in military capital as state j, and thus more in productive capital. The reason is that state j, given its limited resources, will not produce much income; thus state i gains little from investing in predation and instead will invest more in production. State j thus has all the more to gain from predation—it gets a share of the income disproportionately produced by state i. State j will gain relative to state i. In the extreme case, they could end up with the same share of the joint income. Hirshleifer calls this phenomenon the "paradox of power": a weaker state can gain at a stronger state's expense.[12]

This result, however, does not hold for sufficiently high m and for sufficiently great inequality. Above a certain m^*, and with sufficient inequality, state i will be able to invest much more in military capital

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[12] See Hirshleifer, *The Paradox of Power* at 52–59 (cited in note 8).

than state *j* can. State *j*'s resources put a ceiling on the amount it can invest in military capital; once production is down to 0, state *j* can allocate no more resources to the military. But a sufficiently large state *i* can devote much more to the military, and thus maintain or increase its advantage against *j*. An illustration might be the American defeat by North Vietnam and victory over Iraq. In the comparatively low-technology Vietnam War, North Vietnam's lack of productive opportunities made its opportunity cost of military investment very low.[13] As for Iraq, even if it had put all its resources into military investment, it would have been unable to resist superior American technology and training.

This analysis adds a dimension to the earlier model. There is a long history, from the Berber pirates to the current exporters of terrorism, of using international law against small predatory states. Efforts to ban the use of chemical and biological weapons and the spread of nuclear weapons reflect this logic, as does (controversially) recent efforts to ban antipersonnel mines. A small state with powerful weapons can extract tribute, concessions, and other benefits from a much wealthier state, and wealthier states would like to respond, even in concert, by creating international law that restricts the weapons and tactics favoring the small states.[14] The rules requiring humane treatment of POWs, and permitting trickery but not torture to extract information from them, while to all appearances humane, likely benefit wealthier states that have the resources to hold POWs in decent conditions, transport them to safe locations, and conduct lengthy interrogations. But if we can understand why large states would create international law banning these weapons and tactics, we should not be surprised that they have trouble enforcing it. Large states that suffer less from small state extortion have little reason to aid large states that suffer more; indeed, refusing to render such assistance will produce relative gains in a security competition.

The model therefore suggests that small states will not necessarily consent to the laws of war. When North Vietnam objected to a proposed law against cluster bombs during the Lucerne Conference of 1974, a delegate explained that "a weapon used by the imperialist is an imperialist weapon. . . . In the hands of a liberation fighter, it is a sa-

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[13] One must be careful about fitting the model to the facts. The joint income includes control over the economic and political decisions of North Vietnam and Iraq.

[14] Also known as the "weapons of the weak." See Richard Price, *Reversing the Gun Sights: Transnational Civil Society Targets Land Mines*, 52 Intl Org 613, 641 (1998) (describing such weapons as "cheap equalizers that undermine the exclusive advantages of centralized high-technology state violence, both within the state and among the hierarchy of states").

cred tool."[15] Small states seek to outlaw only those weapons and tactics that rich states alone can afford. Rich states will support bans on cheap and effective weapons, and also on more expensive ones to the extent that they are more concerned about their absolute level of production than about the relative standing of poorer states. Multilateral consensus will be difficult to achieve, and peace conferences that begin with high hopes will often produce vague principles or rules with large loopholes—a recurrent complaint about the Hague and Geneva conventions.

C. Destructive Weapons

One can make a useful distinction between *effective* weapons and *destructive* weapons.[16] For a given level of military investment an effective weapon increases the state's share of joint income more than a less effective weapon. By contrast, holding constant its effectiveness, a destructive weapon reduces the size of the joint income more than a less destructive weapon. In the prior Parts, we assumed that military capital had zero destructiveness: The loss of income came indirectly through the investment in military capital rather than productive capital. With positive destructiveness, a weapon reduces the size of the joint income independently of its effect on parties' incentives to allocate resources between the two types of capital.

The destructiveness of weapons appears to be an important theme of the laws of war. Illustrations include limitations on destruction to civilians and civilian structures, on the mistreatment of POWs, on weapons that cause devastating wounds, on mines and other weapons whose dangerousness persists after the conflict ends, and on weapons that cause significant environmental harm. The objectionable feature of these practices is, one might argue, not the efficiency of the technology but the extent to which the weapons harm productive capital, defined broadly to include the human capital of civilians and of soldiers after they are demobilized.

One might therefore conclude that the laws of war are designed to limit the destructiveness of war, and in doing so, to increase production and reduce investment in military capital. But the truth is more complex. It is possible that limits on the destructiveness of weapons make states worse off, not better.

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15 Eric Prokosch, *The Technology of Killing* 155 (Zed 1995).

16 See Grossman and Kim, 103 J Polit Econ at 1279 (cited in note 8). Hirshleifer's model does not make this distinction, and I use a modified version of it in this Part.

To see why, one must understand that the destructiveness of a weapon has a good as well as a bad side. States are less likely to go to war against states that have destructive weapons, even if all states have the same weapons. Assume that each of two states has the same resources. Imagine that the existing military capacity of a state can be measured by a variable v, where a high v means that a given investment in military capacity results in a relatively large reduction in the joint surplus available to both states. If $v = 0$, as in our examples prior to this Part, then each state will invest a given amount in military technology. For $v > 0$, each state will reduce its investment in military technology. The reason is that while a given amount of military activity will have the same distributional effects as before, it will also reduce the size of the joint income that will be divided. With a lower marginal benefit from military investment, states will invest fewer resources in military capital. In equilibrium, there will continue to be some military investment, but less, and the joint income will be higher than it would be if v were equal to 0. If a state can win a war only by destroying the enemy's cities and factories—and in the process loses its own cities and factories as well—then the fruits of victory are not particularly attractive, and neither is conflict.

The argument is not as paradoxical as it sounds: Many people believe that the fear of nuclear destruction prevented military conflict between the United States and the Soviet Union during the Cold War. The deterrence value of these weapons was one reason why the International Court of Justice did not declare them illegal.[17] During World War II, commanders frequently used a similar argument to justify the destruction of cities and civilians through massive aerial bombardment. The more ruthless we are today, the more likely they will surrender tomorrow rather than a year from now.

At the same time, one cannot deny that the general principles of the laws of war—the proportionality principle, and so forth—are in tension with the proposition that destructive weapons are desirable. This proposition thus might better explain why states and international bodies have been reluctant to prohibit particular weapons and tactics that are clearly destructive—nuclear weapons, again, are exemplary—even when they are highly efficient. Restrictions on destructiveness have remained abstract, rhetorical, and ineffectual.

Let me say a few words about destructiveness when states have unequal endowments. Recall that poor states gain more from highly effective weapons than wealthy states do, at least up to some thresh-

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[17] See note 4.

old of effectiveness. This gives wealthy states a reason for favoring laws that limit the effectiveness of weapons. One might think that a similar logic is at work for destructiveness, but there are many offsetting effects. An increasingly destructive weapon makes conflict less likely, but as we have seen, conflict can (but does not always) favor poorer states. On the other hand, the destruction itself is a deadweight cost and can reduce joint income to the point where the poorer state is made worse off. And of course much depends on the extent of the inequality of resources. So it is hazardous to judge the impact of destructiveness on enthusiasm for international law when states have unequal resources.

D. Summary

States have an interest in agreeing to binding (if possible) laws of war that limit the effectiveness of military weapons; but the zone of agreement shrinks as one takes account of (1) the inequality of wealth among states, and (2) the value of destructive weapons for averting war. In the next Part, I discuss further reasons why agreement on robust laws of war is difficult.

IV. COMPLICATIONS

A. Bargaining

In the conflict model, the technology, m, is exogenous, but in the story I tell, the states set the limits of technology by agreeing to laws of war. The conflict model is sufficient for explaining some basic intuitions—the indirect cost of efficient weapons—but raises the question whether states would be able to bargain to an optimal m. Standard bargaining models suggest that they could in principle, but that there would also be significant barriers and complications.

Imagine that states can agree to an enforceable $\overline{m}$, which is less than or equal to the exogenously given level of technology, m. Now the states have two choice variables: $\overline{m}$ and f, the amount that they invest in conflict. If f is observable and enforceable, and the states have full information, they would immediately agree on $f = 0$ for each state, the jointly optimal outcome. If states have private information, or if a very low f is not enforceable, as would be the case if states have exogenous security needs, or must feed a military-industrial complex, or cannot be credibly threatened with retaliation for a low level of investment, then they would agree on some low f, as low as possible, probably after a delay. To the extent that f cannot be observed or enforced, the states have an incentive to agree on $\overline{m}$, in effect substitut-

ing a technological limit for direct regulation of military spending, but only so long as the technological limit reduces the marginal benefit from the investment in *f*. If, as seems likely, states can monitor both *f* and *m*, albeit with difficulty, then it would make sense for them to try to limit both, through arms limitation agreements and laws of war. Note that arms limitation agreements don't usually put a ceiling on military spending but on the amount of spending on a particular weapon. In this respect, they limit investment in conflict by forcing states to choose between spending less on the military, and spending more money on less effective weapons. Laws of war differ from arms limitation agreements by allowing any *f*, but by discouraging investment in *f* by reducing the marginal benefit of the investment.

B. Enforcement

States can enjoy increased levels of production and consumption only if the bargain sticks. In other work, I have argued that international law is best understood as a label for self-enforcing behavior: Self-interested states are constrained by their expectations about the strategies chosen by other states.[18] Such an approach can be used for the laws of war as well.[19] Alternatively, one might believe that the laws of war are internalized by states, and states treat these laws as constraints. Whatever one's view, states will bargain to technological and spending limits only when these limits can be enforced; limits on enforceability probably explain why the laws of war are currently so thin and abstract.

As I mentioned at the beginning of the Essay, states frequently violate the laws of war. The frequency is concealed by the tendency of historians and international lawyers to treat relatively humane behavior as though it were compelled by laws, rather than the result of self-interested military policy. Josiah Ober, for example, argues that the ancient Greeks recognized rules against summary execution of prisoners, attack on noncombatants, pursuit of defeated opponents beyond a limited duration, and many other forms of warfare that are condemned to the present day.[20] But these "rules" could be descrip-

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[18] See Jack L. Goldsmith and Eric A. Posner, *A Theory of Customary International Law*, 66 U Chi L Rev 1113, 1120–33 (1999) (explaining customary international law through game theoretic analysis).

[19] For a theory of compliance with the laws of war, see James D. Morrow, *The Laws of War, Common Conjectures, and Legal Systems in International Politics*, 31 J Legal Stud S41 (2002). He treats the laws as efforts by states to identify in advance self-enforcing strategies in a game of attrition.

[20] See Josiah Ober, *Classical Greek Times*, in Howard, Andreopoulos, and Shulman, eds, *The Laws of War* 12, 13 (cited in note 1) (listing important "unwritten conventions governing in-

tions of behavioral regularities rather than constraints on self-interested behavior. Prisoners are not usually executed, but only because they have value as hostages and are often ransomed. Armies often spare noncombatants because they pose no immediate threat, they can provide supplies, information, and other services, and armies do not wish to give other civilians a reason for resistance. And any army that pursues a defeated opponent risks outrunning its supply lines and falling into disorder. Patterns of behavior that seem humane are not necessarily signs of humanity. The view shared by Ober and others mistakenly assumes that the military objective is always to slaughter as many people as possible, when it is more often to acquire territory and secure other resources, activities that often are best accomplished by treating civilians and even enemy soldiers with restraint. Much the same can be said about the other instances where the laws of war appear to have been observed: the humane treatment of (some) POWs during World War II, the refusal by many states to use poison gas during the same war, and so forth. In fact, however, international law was ignored repeatedly and flagrantly by all sides during World War I and II, and during countless smaller wars throughout the twentieth century.

The weakness of the laws of war is not hard to understand. Although one can derive a reputational theory for compliance, there is no reason to believe that the empirical predicates of the theory are in place. Information asymmetries and coordination problems will interfere with joint efforts to punish states that violate the laws of war. It is always hard to verify that a violation has occurred, and states will often be reluctant to expend resources punishing a violator (who may well be an ally) or, as these game theory models often require, an innocent state that refuses to punish a violator. Asymmetries in power and resources, as explained below, cause further difficulties.

Neither reputational concerns nor interior controls, then, have *much* influence on the conduct of states during war, but they might have *some* influence. If they do, then the laws of war can be understood according to the theory of this Essay. If they do not—if the laws of war are public relations only—then speculation about their nature and purpose is idle.

C. Technological and Other Strategic Asymmetries

A significant barrier to agreement on the laws of war, even if they are enforceable, is the asymmetry of the positions of states. We have

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terstate conflict" in classical Greek times).

already discussed asymmetry of resources; another asymmetry is technological. Russia proposed the Hague Peace Conferences in the hope of restricting a powerful type of field gun recently developed by Austria-Hungary. Austria-Hungary naturally opposed Russia's design and no such law was created. Yet another asymmetry is strategic. Britain sought restrictions on submarines because it feared that they would threaten Britain's dominant navy. States with weaker navies opposed Britain's position.[21] Opponents of the recent treaty that bans mines point out that many signatories have no need for mines; for other states, mines keep the peace between them and belligerent neighbors. When a facially neutral law of war has distributional effects because of the asymmetric positions of states, agreement will be difficult unless there are side payments or compromises. But because of the great heterogeneity among states—and particularly in their technological capacities and their strategic positions—it will be very rare for *all* states to benefit from a significant limitation on weapons or tactics; vanishingly rare if states care about their relative position. Asymmetry of position is probably the most important factor limiting the laws of war, forcing peace conference delegates to produce vague standards rather than crisp rules.[22]

D. Multi-State Agreements and Wars

Wars often involve more than two powers. An increase in the number of states is likely to result in an increase in the amount of military investment, and a decrease in the amount of productive investment. The logic is the same as that for the Cournot model of oligopoly: As the number of firms increases, cooperation becomes more difficult, and the cooperative surplus declines. The laws of war should be either weaker and more limited, or broken more frequently, as the number of states increases.

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21 See Jeffrey W. Legro, *Cooperation Under Fire: Anglo-German Restraint During World War II* 37 (Cornell 1995) (describing France's recalcitrance toward restrictions on submarine use in light of Britain's naval superiority). France during the Napoleonic Wars also attempted to use international law to constrain Britain's dominance at sea. See John B. Hattendorf, *Maritime Conflict*, in Howard, Andreopoulos, and Shulman, eds, *The Laws of War* 98, 107–08 (cited in note 1) (describing the positions of various states concerning maritime laws in the Napoleonic period). There have been similar conflicts between nations that depend on maritime commerce, and their opponents. See Howard S. Levie, *Mine Warfare at Sea* 23–53 (Kluwer 1992) (describing the positions of various world powers during negotiations of the 1907 Hague Convention on Mine Warfare at Sea).

22 International criminal courts and international war crimes legislation also fit within the analysis: The ICC can be understood as an effort to increase the United States's cost of projecting military power. See Jack Goldsmith, *The Self-Defeating International Criminal Court*, 70 U Chi L Rev 89, 100–01 (2003).

The modern laws of war emerged from multilateral conferences and have many signatories. James Morrow argues that laws of war arise when many states agree in advance of war, rather than when a few belligerents agree at the start of a war, because in the prewar period a veil of ignorance facilitates agreement by masking the distributional effects of the laws.[23] The problem with this view is that the multilateral treaty must be self-enforcing; if earlier agreement is disadvantageous to one state at the start of the war, the state will not obey the treaty. In addition, states do send each other messages during wars, in which they abjure first use of a weapon like poison gas but threaten to retaliate in case of use by the enemy. The simplest explanation for multilateral treaties is that every state, or nearly every state, faces some of the same basic strategic interactions in any war, and so there are gains from multilateral negotiations rather than numerous bilateral negotiations. But one conjectures that these treaties have more influence on subsequent two-state wars than on multistate free-for-alls, where strategies of reciprocation are less likely to succeed.

E. Offense and Defense

There is a difference between offensive technology and defensive technology. It is said that the machine gun was a decisive defensive weapon at one time, and the tank was a decisive offensive weapon. One might conjecture that the laws of war would be designed to discourage offensive technology and encourage defensive technology.

The problem with this argument, however, is that offensive and defensive technologies should have similar effects on the depletion of joint income. A high technology offensive weapon encourages each state to invest more in conflict: One dollar on offense now yields a higher share, if the other side's strategy remains constant. But the same argument applies to defensive technology. With highly effective defensive technology, each state will invest more in defense, thus diverting resources from productive uses. The logic is symmetrical.[24]

F. Ineffective Weapons

It is sometimes suggested that laws of war prevent states from using *ineffective* weapons, rather than effective weapons.[25] The laws

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23 See Morrow, 31 J Legal Stud at S54–S55 (cited in note 19).

24 Grossman and Kim's model distinguishes offense and defense, and what for Hirshleifer is the "conflict technology" is for Grossman and Kim the advantage of offense over defense.

25 See Walzer, *Just and Unjust Wars* at 129–30 (cited in note 4) (attributing this view to Henry Sidgwick). This is also an implicit theme in Best, *Humanity in Warfare* at 280–85 (cited in note 1), where he argues that area bombing during World War II was illegal because it was both

against use of poison gas might have succeeded because poison gas was an ineffective weapon. Humane treatment of POWs might be a useful strategy for encouraging surrender. These arguments might be true, but it is hard to understand why states would bother to outlaw practices that have no military value. A state would unilaterally refrain from those practices and hope that the enemy is foolish enough to engage in them. There is no law against the bow and arrow; why should there be a law against poison gas that blows back onto friendly troops? It might be the case that these weapons have a very small military value, and so states comply with international law in order to enhance their reputations for being good international citizens; but if the cost of refraining from use is so small, the reputational gain should be minimal. It might also be the case that war is a primal cultural expression rather than an instrument of policy,[26] and perhaps states in interwar periods hope to prevent a predictable descent into barbarism during times of war. But international law would not be much use against those seeking a Götterdämmerung. The better interpretation is that states ban weapons and tactics that states believe, or fear, will be highly effective, and indeed that was the attitude motivating regulation of poison gas prior to World War II.[27]

V. EMPIRICAL ANALYSIS

The Hague Peace Conferences of 1899 and 1907 collectively produced twenty-three conventions, declarations, and final acts. Forty-six states signed, ratified, or adhered to some or all of the seven 1899 documents by 1907. Forty-five states signed, ratified, or adhered to some or all of the sixteen 1907 documents by 1914. I analyzed these data statistically, focusing on the 1907 documents because there was greater variation in the states' responses.

For the dependent variable, I use the number of documents that a state signed, ratified, or adhered to, minus the number of reservations.[28] This is a rough measure of a state's enthusiasm for laws of war, as incorporated in the 1907 documents. For the 1907 conference, the dependent variable could range from 0 to 13;[29] in fact, the range was

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inhumane and less effective than precision bombing.

26 See John Keegan, *A History of Warfare* 3 (Knopf 1993) ("[W]ar antedates the state, diplomacy and strategy by many millennia. Warfare ... reaches into the most secret places of the human heart, places ... where emotion is paramount, where instinct is king.").

27 See Legro, *Cooperation Under Fire* at 158–59 (cited in note 21).

28 The source of the data is The Carnegie Endowment for International Peace, *The Reports to the Hague Conferences of 1899 and 1907* 175–77, 898–901 (Oxford 1917) (James Brown Scott, ed).

29 I excluded the first three conventions (for the pacific settlement of international dis-

from 4 to 13. One might argue that it is inappropriate to subtract reservations because they reflect the seriousness with which the state takes its responsibilities under international law; and, indeed, democracies use reservations in human rights treaties more often than dictatorships. But there is not a statistically significant relationship between the democratic status of a state and its use of reservations to the 1907 laws of war.

The most concrete result of the conflict model is a prediction that states will support laws of war that limit effectiveness but not laws that limit destructiveness. But although the distinction is conceptually clear—a neutron bomb is less destructive than conventional explosives of equal magnitude, but just as effective—I have not found data that reflect this distinction. So instead I focus on some subsidiary, and more ambiguous, hypotheses.

First, I hypothesize that militarily weaker states will more strongly support the laws of war when they involve expensive new technologies, as was the case with the Hague Conference, which can be traced to the emergence of frightening and expensive new weapons from the industrial revolution.

Second, states that have recently been in wars will more strongly support laws of war, because they will have better information about the effectiveness of weapons.

Third, economically powerful states will more strongly support the laws of war because they gain more from production than from military predation.

Fourth, democracies seem more likely to support laws of war than non-democracies, either because of the public relations value of international law (an old realist chestnut) or because democracies place greater value on the rule of law than non-democracies do.

Variable definitions and sources, and summary statistics are in the appendix, and the results are in Table 1.

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putes, the limitation of the use of force for the recovery of contract debts, and the opening of hostilities) because they are not traditionally included among the laws of war. If these conventions are included, the results for the population variable remain robust, and the democracy variable is no longer significant. See the regression results in the working version of this Essay, online at http://ssrn.com/id=332620 (visited Nov 8, 2002).

TABLE 1

democracy	**0.19 (2.02)**
military expenditure (millions of nominal British pounds)	**-0.03 (-1.82)**
war in last 30 years	-0.82 (-0.13)
population (logged)	**-0.43 (-2.08)**
obs	40
adj r^2	0.276

Note: dependent variable is number of 1907 conventions, declarations, etc., to which state agreed, minus reservations; t-statistic in parentheses; in bold if statistically significant at the 0.1 level or below.

The military variable is consistent with the weak state hypothesis; the war variable provides no support for the learning hypothesis; and the population variable contradicts the economic power hypothesis, though it is not clear whether population is a good indication of economic power (GDP and similar measures were not available). Perhaps more populous states, even those that have not invested much in the military, feel relatively secure, and are thus reluctant to bind themselves to international law. Democracies are more enthusiastic about the 1907 Hague conventions than non-democracies.

I do not want to make much of either the negative or positive results. One can think of lots of reasons for not trusting the data (including the low number of observations, the unreliability of historical data, and the high degree of multicollinearity). But further research would be illuminating, and a natural place to start would be the Geneva Conventions, and in particular the length of time before a state ratified them, and the number of reservations.

CONCLUSION

One cannot say with confidence that the laws of war constrain the behavior of states, but one can say that states see an advantage in entering treaties and conventions regarding the laws of war. This might be public relations, as is sometimes argued, but it is just as likely that states perceive a more concrete benefit if mutual compliance turns out to be possible. The benefit, should mutual compliance occur, is greater production and consumption for civilians than would occur if military investment were unconstrained. In this way, the laws of war (*jus in bello*) are consistent with other laws and agreements about war. Laws of war, arms control agreements, and limitations on the conditions under which war can be started (*jus ad bellum*), work together to reduce the total amount of resources devoted to predatory activities.

This argument should not necessarily be considered a rejection of the humanitarian view. Reducing conflict so that states can invest in production is broadly consistent with humanitarian aims. The problem with existing statements of the humanitarian view is that they are not clear and not parsimonious, and the theory presented in this Essay can be seen as a first effort to fill this gap in the literature.

APPENDIX[30]

A. Two Equal States

There are two states ($i = 1, 2$) with equal resources, r ($r = r_1 = r_2$). Each divides r_i among productive effort, e_i, and fighting effort, f_i. Thus: $r_i = e_i + f_i$. They produce *joint* income of y, and we will assume $y = e_1 + e_2$. Each state's share of the income (p_i) is a function of the amount invested in effort: $p_i = f_i^m / (f_i^m + f_j^m)$, where $j \neq i$, and m is the conflict technology. Thus, each state obtains income of $y_i = p_i y$.

Each state maximizes its share of the income given the other state's strategy of maximizing its own share. The reaction curves (except for corner solutions) are:

$$f_i / f_j^m = m(e_1 + e_2) / (f_1^m + f_2^m)$$

It follows that: $f_1 = f_2 = me_1 = me_2 = r - me_1$. It is clear that as m increases, the share of income devoted to fighting increases, the share devoted to productive effort declines, and income declines.

Let $r_i = 100$. (Thus joint resources are 200). If $m = 1$, then each state devotes 50 to fighting and 50 to production. Income is thus 100, and each state ends up with 50. Conflict dissipates 100.

Now let $m = 2$. Then each state devotes twice as much to fighting as to production. Given initial resources of 100, each state devotes 67 to fighting and 33 to production. Income is thus 66, and each state ends up with 33. Conflict dissipates 134.

The states would be jointly better off if they could agree to limit m (or f). Technically, limiting m means preventing either side from improving weapons and tactics in such a way that would increase its share of the income if the other side did not also improve weapons and tactics.

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30 Parts A and B are based on simplified versions of the model in Hirshleifer, *The Paradox of Power* at 55 (cited in note 8); Part C contains a modified version of that model.

B. Two Unequal States

Now let $r_1 > r_2$. Hirshleifer shows that under certain conditions, the poorer state can obtain a (relative) advantage from conflict with a richer state. Formally, $y_1 / y_2 < r_1 / r_2$. Here is his numerical example:

Let $(r_1, r_2) = (200, 100)$, and $m = 1$. From the reaction curves, $(f_1, f_2) = (75, 75)$, $(e_1, e_2) = (125, 25)$, and $(y_1, y_2) = 75, 75$. Thus, the states go from a relationship of inequality to a relationship of equality.[31]

However, at a sufficiently high m the original relationship of inequality will be sustained or made more extreme. Consider, for example, the case where $m = 3$. If there were an interior solution, state 2 would need to invest more than 100 in f_2; with the resource ceiling state 2 will invest 100 only. State 1's best response is to choose $f_1 = 113$. Thus: $(e_1, e_2) = (89, 0)$, and $(y_1, y_2) = (49, 40)$. Here, the rich state retains a relative advantage, although not as high as when it began. But as m increases, the rich state will obtain an increasingly large portion of the initial income, and eventually will improve its relative position. Thus, if military technology is relatively low, and resources are not too unequal, rich states will seek to limit military technology, and poor states will not; if military technology is relatively high, and resources are sufficiently unequal, poor states will seek to limit military technology, and rich states will not.

C. Destructiveness

We can add a variable v, for destructiveness, and alter Hirshleifer's model in the following way. For state 1 (and similarly for state 2), let:

$$y_1 = \left(\frac{f_1}{f_1 + f_2}\right) \frac{e_1 + e_2}{(f_1 + f_2)^{\frac{v-1}{v}}}$$

The destructiveness variable, $v \geq 1$. If $v = 1$, then the model is the same as Hirshleifer's (with $m = 1$), which assumes no destructiveness. For a higher v, the surplus declines in proportion to the amount invested in military capital.

Using constrained optimization, the reaction curve for state 1 (and similarly for state 2) is:

$$\frac{vf_1}{f_1 - v(f_1 - f_2)} = \frac{e_1 + e_2}{f_1 + f_2}$$

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[31] Hirshleifer, *The Paradox of Power* at 53 (cited in note 8).

One can see that when $v = 1$, Hirshleifer's reaction curves are obtained. It is also clear that total productive investment (that is, joint income) is increasing in v, that is, with destructiveness. For the equal resources case, $e_i = fv_i$.

D. Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
dependent	45	10.6	2.1	4	13
democracy (0–10)	44	3.1	3.1	0	10
population (1000s)	45	23753	66296	240	425577
military expenditures (1000s of £'s)	43	8952	21037	35	119587
war since 1870 (yes=1)	47	0.4	0.5	0	1

Variable definitions:[32]

Enthusiasm (dependent). The number of conventions, declarations, acts, and protocols which a state signed or ratified, or to which it adhered, minus the number of reservations, at the Hague Conference of 1907. The first three conventions were excluded because they are not technically a part of *jus in bello*, the subject of the analysis. No distinction was made between earlier or later expressions of consent that occurred by 1914; and only states that had consented by 1914 were included in the study.

Democracy. A scale from 0 (undemocratic) to 10 (highly democratic) developed by political scientists; the scale focuses on the degree of political competition. For a discussion, see the website address in the footnote.

Population. The number of citizens in 1900 or the closest year for which there are data up to 1910.

Military expenditures. The amount of money (in thousands of British pounds) spent on the military, in 1900 or the closest year for which there are data up to 1910.

War since 1870. A dummy variable equal to 1 if the state was in a war since 1870, and 0 otherwise.

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[32] Democracy variable from the Polity II dataset, online at ftp://isere.colorado.edu/pub/datasets/p4/p4vksg.asc (visited Nov 12, 2002). Wars since 1870 are from Melvin Small and J. David Singer, *Resort to Arms: International and Civil Wars 1816–1980* 82–99 (Sage 1982). All other data are from the Correlates of War Project at the University of Michigan, online at http://www.umich.edu/~cowproj/dataset.html (visited Nov 12, 2002). The baseline was 1900, though not all data were available for that date; if not, data within ten years were used.