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# Asymmetry and Power: Can Ethnic Dominance Minimize Ethnic Conflict?\*

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## Abstract

This discussion piece argues that situations in which there are two similarly strong contestants (*Symmetry*) are often marked by long and expensive struggles for advantage and power. In contrast, an arrangement in which only one party gets access to all/most resources (*Asymmetry*) can minimize the cost/incidence of such struggles. For example, in their heydays, the Roman, Soviet, Habsburg, and Osman empires effectively reduced arms-races and armed conflict among their ethnic constituents. The *Pax Romana* was a powerful argument in favor of one-group dominance.

The costliness of power struggles is determined both endogenous and exogenously. For example, while minorities can spend resources to arm themselves, their ability to fight depends also on such factors as terrain, the effectiveness of available weapons, and their role as offender or defender. I would argue that the Bosnian conflict was so costly precisely because the Bosnian terrain largely neutralized the arms advantage of the Serb faction.

However, one should not take too narrow a view, because there are also forces making *asymmetry* more costly. Achieving or maintaining dominance (especially against forces/struggles from within—possibly among symmetrically similarly powerful lobbyists) can be expensive and distort incentives. Further, if dominance permits genocide, it may indeed occur. The potential exploitation of the loser may crystalize the opposition—indeed, there is a common notion that “oppression” and violations of “fairness” can lead to strong efforts by the weaker party.

If the audience is to come away with any insights from this piece (and few of the arguments are really new), it is simply that helping a weaker party in the interest of “fairness,” as the U.S. has done in the case of many of its interventions, can potentially escalate and prolong conflicts to the point where no intervention, or even intervention on the stronger party’s side, would have been better for all parties involved.

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# I Introduction

This discussion piece argues that situations in which there are two similarly strong contestants (*Symmetry*) are often marked by long and expensive struggles for advantage and power. In contrast, an arrangement in which only one party gets access to all/most resources (*Asymmetry*) can minimize the cost/incidence of such struggles. For example, in their heydays, the Roman, Soviet, Habsburg, and Osman empires effectively reduced arms-races and armed conflict among their ethnic constituents. The *Pax Romana* was a powerful argument in favor of one-group dominance.<sup>1</sup> The suppression of Bosnian, Kroat, and Serb differences by the Osman, Habsburg, and Yugoslav power is by no means unique. The Soviet union suppressed ethnic conflict between Azers and Armenians. (The Soviet Union's demise does not bode well for the native Russians placed in the Baltics, however.) The Kurdish conflict continues, because the geographical topology of Kurdish territory has largely prevented a decisive victory by outside forces. Under Osman domination, Palestinians and Jews had fairly harmonious relations for a prolonged period of time and neither assaulted their occupier. Lebanese did not spend much time and suffer significant costs of lives when Christians or Syrians ruled—only when factions were of similar strengths did ethnic differences become a social liability. In both Iraq and Iran, one segment of the population tends to dominate political affairs. Whenever this segment is weakened, conflict flares up and the population suffers. The arms-race (cold conflict) between the Soviet and U.S. superpowers was so costly because both sides perceived their strengths to be about equal. The disappearance of the Soviet empire has not only reduced Russian costs, it has also reduced U.S. costs.<sup>2</sup> Indeed, we are always surprised to hear of prolonged wars and conflict when one party is overpowering.<sup>3</sup> Similar capabilities appear to us to be a necessary condition

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<sup>1</sup>The dominant power, the empire, suppressed conflicts (made it infinitely costly) among its constituents. While strong, the only fight that could have broken out would have been between the empire and the constituent itself. With a strong empire, there was no incentive for the constituent to engage in fighting efforts.

<sup>2</sup>In many of these situations, even the loser is better off if the other side ends up the dominant force—it is just that the loser cannot commit itself not to arm itself.

<sup>3</sup>Hard information on military potential of ethnicities and terrain defensibility is difficult to come by. It is slightly easier to obtain estimates for border wars (the following are estimates from U.S. navy intelligence sources). South and North Vietnam had \$300 and \$400 million invested; the USSR and the USA had \$275 and \$265 billion invested by 1985; Serbs had \$350 million, Muslim and Kroats had \$470 million invested.

of costly conflict.

The insight that asymmetry can reduce conflict costs and thus be of benefit to all is not new. In Chapter 16 of *The Prince*, Machiavelli observes that ex-ante strength can reduce the costs of ex-post arming and conflict:

Therefore, a prince, not being able to exercise this virtue of liberality in such a way that it is recognized, except to his cost, if he is wise he ought not to fear the reputation of being mean, for in time he will come to be more considered than if liberal, seeing that with his economy his revenues are enough, that he can defend himself against all attacks, and is able to engage in enterprises without burdening his people; thus it comes to pass that he exercises liberality towards all from whom he does not take, who are numberless, and meanness towards those to whom he does not give, who are few.

Even earlier, Plato recognized the more general nature of this argument. In *Gorgias*, Callicles observes that

But my opinion is that nature herself reveals it to be only just and proper that the better man should lord it over his inferior: it will be the stronger over the weaker. Nature, further, makes it quite clear in a great many instances that this is the true state of affairs, not only in the other animals, but also in whole states and communities. This is, in fact, how justice is determined: the stronger shall rule and have the advantage over his inferior.

Similarly, the fact that situations which display *asymmetry* can have lower costs of subsequent struggle has appeared in a number of situations (and guises) in the economic literature. The pioneer in the conflict area is Jack Hirshleifer ((1991a), (1991b), (1993), (1995)). Skaperdas (1992) innovates in introducing asymmetric agents to a model in which agents decide between production and fighting. My own discussion piece here is similar insofar as it is also concerned with asymmetries among fighters (and insofar as an equilibrium can arise in which rent-seeking seizes). Neary (1996) is a fascinating model in which income effects reduce fighting. In many instances (one party is poorer), and only one of the two contestants is fighting. Becker (1983) introduces the strength/coordination of group organization (asymmetric power) into lobbying (rent-seeking). Rajan and Zingales (1995) endogenize party's property rights in a different way. They argue convincingly that parties

cannot simply give in and transfer resources in exchange for a reduction in fighting, because these very resources can be used to strengthen one's fighting ability and thus extort more resources. Most similar, though, is ?, which models conflict between banks and public creditors, and argues that legal costs are minimized when strong banks receive claims that give them preference.

There is also a large (and occasionally overlapping) literature discussing ethnic, political, and even inter-species conflict.<sup>4</sup> Kuran (1995) and Kuran (1998) model the international and intra-national ethnification process. Vehrencamp (1983) tries to explain (in a different manner) under what circumstances despotic and under what circumstances egalitarian societies can arise.

In some sense, this discussion piece is written to focus on and distill asymmetry as a driving determinant in both economic models and in real life, and to discuss the design of *ex-ante* systems that create asymmetric situations. While all arguments proposed here have been made since ancient times, I am unaware of any paper in the social sciences that crystalizes this argument.

**Outline:** This piece now proceeds as follows: Section II presents a simplified model (the appendix contains a more general version), and discusses the particular functional forms here employed. Section III touches on some other forces that are closely related, and that may work against the recommendation of "encouraging asymmetry to reduce conflict costs." Section IV discusses some other applications of the asymmetry idea. And Section V concludes.

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<sup>4</sup>The reason why I call this paper a "discussion piece" and not a "working paper," is that I am not sufficiently familiar with the political science literature on the subject of (ethnic) conflict. I am currently (slowly) researching earlier work in the area, and I am planning to cwork together with an expert in the area to convert the current draft into a publishable paper.

<b>Please bring to my attention any papers with similar arguments.</b>
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## II The Model

### A An Abbreviated, Simple Version

I will begin by building a simple model that features players (ethnic groups or states) with (possibly) different strength and (possibly) asymmetric persuasion ability (a biased “terrain”). This small model can generate and address some of the basic questions of this discussion piece.

Consider a specific contest function that maps fighting/lobbying effort into an allocation (the appendix generalizes this setup). Define  $\alpha$  as the proportion of the pie accruing to player *A*, and determined in the following manner:

$$\alpha = \frac{nL_a}{L_a + mL_b}$$

where  $L_a$  and  $L_b$  are the fighting efforts of the two players, *a* and *b*, and *n* and *m* are two parameters (s.t.  $0 < \alpha < 1$ ). If  $m > 1$ , then player *b* is more “persuasive.”  $n$  ( $0 < n < 1$ ) is a measure of how much surplus can be allocated to player *a*. The pie to be split is  $P$ . Let  $P_a$  be the allocation of player *a*,  $P_b$  be the allocation of player *b*. Finally, let  $c_a$  and  $c_b$  be the cost of fighting of the two players.<sup>5</sup>

To elaborate on the setup, there are two parameters that differ between players. The parameters  $m$  and  $n$  could be called the persuasiveness, the skill, or even the “bias in the natural terrain” of the conflict (in that equal  $L_a$  and  $L_b$  favor one player over the other). The parameters  $c_a$  and  $c_b$  could be called the “strengths” of the players. It is the cost that each player needs to invest to produce a unit of fighting.

Consequently, the payoff functions for the two players are<sup>6</sup>

$$P_a = \alpha(L_a, L_b)P - c_aL_a$$

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<sup>5</sup>This has sometimes been called a “rent-seeking” setup, rather than a true conflict setup. The two differ in that, in the rent-seeking setup, players own their weapons; in the conflict setup, obtaining the weapons themselves are subject to conflict.

<sup>6</sup>There are two primary scenarios, one in which fighting costs are part of the value (that is, the two players can use up the pie over which they fight) and one in which fighting costs are born by the players themselves. (The outcomes differ in interesting ways, but we will only discuss the scenarios where players internalize their fighting costs due to space constraints.)

$$P_b = [1 - \alpha(L_a, L_b)]P - c_b L_b.$$

The equilibrium is the optimal two choices  $(L_a^*, L_b^*)$  from the two *quadratic* first order conditions ( $\frac{\partial P_a}{\partial L_a} = 0, \frac{\partial P_b}{\partial L_b} = 0$ ):

$$L_a^* = \frac{c_b m n}{(c_b + c_a m)^2} P$$

$$L_b^* = \frac{c_a m n}{(c_b + c_a m)^2} P.$$

Total waste  $W$  in equilibrium,  $W \equiv c_a L_a + c_b L_b$  is

$$W = \left[ \frac{2c_a c_b m n}{(c_b + c_a m)^2} \right] P = \left[ \frac{2m}{R(1 + m/R)^2} \right] n P$$

where  $R \equiv c_b/c_a$ . This shows that there are two minima where waste approaches zero:  $m$  is very low and  $R$  is very high (player  $a$ , the more persuasive player, has lower fighting cost), or  $m$  is very high and  $R$  is very low (player  $b$  is more persuasive and has lower cost of fighting). Waste is *maximized* when higher persuasion ability “neutralizes” the relative fighting cost disadvantage of the higher-fighting-cost player (i.e., when the environment [terrain] favors the lower-cost fighter; algebraically,  $m = R$ ). Two equally persuasive ( $m = 1$ ) and equally low-cost fighters ( $R = 1$ ) tend to produce “a lot of” waste.<sup>7</sup>

This small model has answered one of our basic question: if there are two intrinsically different players, who should be assigned the “more persuasive” role. Equivalently, if one of the players is intrinsically more persuasive, should he/she be handicapped or subsidized? (On conflict cost minimization grounds, our answer is “the latter,” but see the discussion of model extensions below.)

## B Model Robustness

One natural question that should be asked of all models is how robust they are to variations in, or generalizations of, their algebraic specifications. It turns out

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<sup>7</sup>We did not give *defense* an intrinsic (but imperfect) advantage over *offense*. Doing so would strengthen our argument.

that the asymmetry-minimizes-conflict argument, while not universal, is unusually robust to alternative specifications. The appendix describes the conditions under which *ratio* contest success functions (where outcome is determined only by the ratio of the expenditures of the two contestants) produces the result that asymmetry minimizes conflict. The appendix also shows that *difference* contest success functions tend to produce the same result.

## C Discussion and Ex-Ante Design

The advanced hypothesis is simple: conflict costs can be lower when the strong party is very strong and the weak party is very weak. Put another way, *deterrence* and thus conflict is often maximized when the parties are unequal.<sup>8</sup> The strong can often deter the weak from assaulting their superior resource base.

This simple insight lies at the heart of an entire set of an interesting set of implications.

1. There is an interesting relation of our power argument with the Coase (1960) theorem. Our argument suggests that it is preferable to assign (property) rights *ex-ante* to the *ex-post* stronger party. If the (property) rights are assigned to this stronger party, it is less likely that the weaker party will expend effort to try to acquire control and therefore that the stronger party will have to expend effort to try to defend these property rights. In a sense, the Coase (1960) theorem states that it is efficient to assign (property) rights. We emphasize that property rights may not always be perfectly assignable; and when they are not, it is efficient to assign (property) rights *to those who can defend them at lowest cost—and to create default allocation rules and contestants that facilitate efficient “deterrence” and “defense.”*

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<sup>8</sup>Although one can concoct models in which *deterrence* works better when both parties are symmetric—e.g., when escalation can quickly kill both parties, both parties will avoid escalation and instead pursue a “cold” war—the above model (and a wide class of models) suggests that symmetry is inherently weak in deterring conflict. There are models in which a weaker party allocates its effort to fighting and a stronger party allocates its effort to production. The above model has focused only on situations where unequal strength minimizes fighting. The discussion below may consider the conditions under which equal strength minimizes fighting.



2. The above argument, *i.e.*, that *conflict costs are lower when one can strengthen strong powers and weaken weak power*, is related to but different from the argument that stronger fighters end up with the lion share.<sup>9</sup> Although the natural accumulation of resources by power clearly has consequences on future power allocations, the argument proposed here suggests that a conflict-cost minimizing *ex-ante* arrangements should hand the stronger party the lion share *ex-ante* to prevent fighting. The dynamics of the problem (in repeated interactions) suggest an acceleration and magnification of differences.
3. The Hegelian-Marxist view of a historical (dialectical) materialism—the ultimate progression towards a final state of harmonious, communist (*i.e.*, equal) system—may be flawed, in that symmetric power arrangements may be intrinsically unstable (because they cause large conflict expenditures).
4. Presuming that *evolution*, not only in nature but also the battlefield and in the market-place, are effective filters in favor of more efficient lesser-conflict situations/alignments, one can reexamine the *ex-ante* choices and institutions that might have arisen to reduce the costs of later conflict. In sum, arrangements that create unequal players (tribes, ethnicities, nations) and institutions/terrains that create unequal fighting positions, and situations in which institutional and player advantage are sorted, are advantageous. Whatever makes the strong party/terrain stronger and the weak party/terrain weaker reduces conflict costs.

This is an interesting optimization problem, because evolution works at different speeds on different factors. Terrain is exogenous in the short-run, but often modifiable in the long-run.

- A situation in which two ethnic groups evolve in close proximity would minimize conflict if the two groups were different in natural strengths. Such situations are likely to display long-term stability. (One might argue that the Zulu and Bushmen fit this category. Although the Zulu are the better off of the two, internal conflict (see **group integrity** below) and unfittedness probably prevents them from invading Bushmen territory.)

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<sup>9</sup>Rajan and Zingales (1995) have an interesting argument about why conflict cannot be resolved through side-payments. A weaker party cannot buy peace with a maintained high resource base, because transferred resources further strengthen the incentives of the now stronger party to appropriate those resources.

- Areas in which the fertile regions are also the most defensible regions suffer from less conflict. (Therefore, *ceteris paribus*, the entire region [both high and low-quality land, overall] should develop at a faster pace.)
- Areas with asymmetric terrains are (unconditionally) less likely to suffer from conflict than areas with symmetric terrain. An area with some (defendable) high-fertility and some low-fertility terrain is better than an area with medium-fertility terrain.
- An unusual entry of a new strong tribe into an asymmetric region settled by weaker tribes is likely marked by unusually high conflict, because terrain and natural strength neutralize each other to the point where strengths become roughly equal. (See also hierarchy below.)
- When two groups move into a new region, the initial settlement of this new region is likely to be marked by less conflict when it is highly asymmetric.
- New weapons technology that is expensive probably reduces conflict, for only the stronger party is likely to have the resources to field them. When weapons become cheap, and relatively cheaper for the weaker party (e.g., rifles replacing bows-and-arrows, which required years of training), conflict is likely to flare up.
- When a homogeneous group of people disintegrates into tribes, it may naturally split up into a stronger and a weaker ethnic group, rather than two equally strong parties. (But see **group integrity** below.)

### III What other efficiency considerations can be countervailing forces?

This last question is particularly interesting, but requires going well beyond the model (and perhaps a liberty to talk about issues that are well beyond “generally accepted economics principles” (GAEP)). After all, most of us believe that dictatorship does not dominate democracy, that hierarchy does not naturally dominate partnerships, that slavery does not dominate employment. The model above only points out one advantage of asymmetry (*and, while it is controversial, it is real!—there is a reason why Nazi<sup>10</sup> Germany seemed to operate rather efficiently in the short-run and why a system of roughly equally strong parties has produced extensive spending on Washington rent-seeking*). In any case, the reader should be warned that *economic efficiency* is not the ultimate moral ethic by which outcomes should be judged as desirable or undesirable. In a sense, understanding the asymmetry argument is a starting point to start identifying the benefits, both economic and uneconomic, to *symmetry* and the situations under which either the benefits and under which the costs prevail. I can identify at least some countervailing forces.

**No-Conflict-Possible:** In many cases, the mechanisms (terrain) itself is fully endogenous, e.g., government and judicial systems. While asymmetry can reduce conflict among parties, so can decreed (legislative/judicial) non-conflict rules. If engaging in rent-seeking is futile to begin with, no resources will be expended on rent-seeking. The choice between a system in which the stronger of two ethnic groups can lobby to obtain more resources/power/judicial preference is superior to one in which the weaker of two parties can lobby, but it is worse than a system in which neither party can.

**Intra-group Conflict and Group Integrity** Our model has strong implications, but suffers from (at least) one simplification that is too drastic: Groups are rarely homogeneous and are often not exogenously formed either. Europe was relatively united against the Mongolian invaders, India was relatively disunited against the British invaders. An external threat sometimes unites, sometimes

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<sup>10</sup>I am the son of a concentration camp survivor. Thus, it is easier for me to take some liberty in attributing a positive aspect of totalitarianism to the Nazi system.

divides. (A clear part of this puzzle is the behavior of the stronger power as a winner with respect to the loser.)

Similarly, after asymmetry might have led to a total annihilation of the opponent at “low conflict cost,” the subsequent disintegration of the winning party into equally strong parties may cause even more conflict than when asymmetry would have been avoided in the first place. In one sense, a symmetric power arrangement may have high conflict costs, but the prolonged presence of the conflict can prevent even higher conflict costs within the dominant group otherwise.

This factor, i.e., relevant group constitution, cannot be underestimated. The reader is again referred to Kuran (1995) and Kuran (1998), which model the process by which groups “crystalize.”

**Ex-ante Incentives:** This is closely related to the fact that economic (conflict) considerations are not the only determinant for choosing systems (when they can be chosen!) For example, a judicial rule that always favors the stronger party could induce the stronger party to commit murder, knowing that he/she will get away with it. Obviously, incentivizing murder may *not* be the value-maximizing solution. In equilibrium, under appropriate conditions, an optimal judicial rule may balance the incentives to commit criminal acts against the expected legal costs from too equal a battleground in the court. An ethnic group that knows that it can lose a later conflict because it is of similar strength than another group may decide not to move into a region of overlap, and thus avoid all conflict costs.

**Other Positive Conflict Externalities:** A third, related force limiting the benefits to extreme asymmetry may be that conflict costs may partially create a (possibly positive) externality elsewhere. Legislators obtain benefits from lobbyists, and thus may be eager to maintain a “balance of power.” In murder trials, it might be optimal to try to equalize the two parties (in order to maximize the incentives of the two parties to spend effort on producing information, which reduces the incentives to commit murder by making murder more costly and by making murder more easy to detect); but in parking violations, the optimal

social rule may be to favor one side (the police).<sup>11</sup>

In the context of ethnic conflict, a situation may arise in which three ethnic minorities occupy the same region. It may minimize conflict costs to have the two weak but equally strong minorities fight with one another, and have a third strong minority. (In fact, “scape-goating” by one major group of another group can reduce conflict between the major group and a third group.) The conflict between the first two minorities may weaken them to the point that it prevents an even larger and costlier conflict. A cynical point of view may have the U.S. support the Kurds and Shiites in Iraq, because it reduces the conflict efforts Saddam Hussein exerts against the U.S. Israel sells itself to U.S. politicians as a target and thereby container of middle-east anti-Western sentiments.

The benefits need not only be driven by conflict itself. For example, conflict may control population and thus prevent resource exhaustion, which could lead to an even worse situation. Perhaps less offensive to the reader, conflict may lead ethnic groups to innovate, e.g., to produce better science and weapons.

An especially troublesome frequent outcome of ethnic conflict is genocide. But genocide is neither a feature of asymmetric strengths nor of conflict per se. One could argue that asymmetry makes genocide more likely: genocide could prevent future conflict between the two ethnic groups by making the weak group infinitely weak. (Although, it is unclear how the winner preserves homogeneity. See above.) Genocide may also occur when there is no conflict and the winner has a “taste” for genocide. Jews in the Nazi regime were not a major threat, but were still exterminated. But one could also argue that asymmetry protects against genocide by reducing the efforts expended on conflict.

Taking a step back, as a “designer” of a situation to minimize conflict costs, the first-best choice is an ability to impose “no-conflict” rules, terrains, etc. The second-best choice is an ability to maximize differences among groups as far as redistributable assets are concerned. One would like a situation in which the weaker party’s survival (minimum welfare) cannot be assaulted.<sup>12</sup> The worst outcome is a

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<sup>11</sup>Hitler set up similarly powerful bureaucracies with overlapping competencies to induce them to expend their resources on inter-agency fighting, deflecting their energies away from himself.

<sup>12</sup>Jack Hirshleifer’s argument that rage and revenge can be *ex-ante* rational to prevent worse consequences *ex-post* may come into play here.

situation in which there are two equally strong parties with an ability to slowly escalate conflict.

Clearly, it is not too difficult to produce models with different tradeoffs; models, in which there are some corner solutions and others in which the solutions are interior. This matches real life—perfect symmetry, perfect asymmetry, and outcomes in-between are observed in different situations.

## IV Alternative Realms of Application

The evolution of ethnic groups is related to the evolution of tribes and species. There are species in which acquisition of the dominant role does not provide access to preferable territories, but instead provides “only” temporary access to females. It would not be advantageous for such species to have constant, all-year mating (and thus fighting) patterns, compared to species in which dominance secures better food supplies. (Better food supplies reinforce the position of the dominant, weakens the position of subordinates, and this in itself deters further conflict). Similar arguments might be made about tribes, in which fighting may secure control of better food supplies. If terrain can be transformed to make one area more desirable/defensible than another (e.g., by building castles), it could be advantageous to a population that might later split into tribes. For a long time, Yugoslavia was dominated by one group (the Serbs), which kept ethnic strife in check. (Similarly, the Habsburg empire was the dominant force in the area earlier.) The emergence and strengthening of other ethnic factions (partially by outsiders) has led to a costly escalation of conflict that might have been avoided. Larger states with one dominant party may arise not only to protect themselves against mutual enemies, but also to guarantee the hegemony of a particular part of the country (typically, the area of the capital).

The scope of applications of asymmetry as one important factor is fairly wide. Here is a partial list of some potential applications:

**Hierarchies** Using a vertically hierarchical organizational structure may cut down on the lobbying expenses. If one person is identified as the “boss” and the

other as the “employee,” the employee probably expends less effort to try to dislodge the boss than if they are both on an equal level.

To elaborate, employees can be organized into a vertical organization (a hierarchy) or into a horizontal organization (a partnership). The theory suggests that an advantage of a vertical organization is that it may cut down on efforts of the weaker party to draw surplus from the stronger party which may also cut down on the required efforts of the stronger party to defend himself/herself. Thus, it may be efficient to provide the “boss” both with more power (formal and informal), and to teach him how to lower his costs of fighting (“executive training”). For example, one might vest control over employment of the subordinate with the boss. Alternatively, one would have different people/departments become experts in different areas, and the optimal mechanism might give the relevant (thus more persuasive) experts formal (and informal) decision power.<sup>13</sup>

Naturally, there are also costs to vertical organizations. For example, by handicapping fighting between employees, competition between them may also be handicapped. (Lazear and Rosen (1981) show that tournaments can provide proper incentives. An optimal hierarchy may trade off some competition against some fighting.) An interesting case in point is the difference between the German and the U.S. academic system. In Germany, each area has only one professor,<sup>14</sup> whereas the “college” system rules in the United States. In Germany, there is little area-internal strife (most strife is between areas). In contrast, in the U.S., departments have been known to deteriorate when equally strong coalitions of professors form to fight one another<sup>15</sup>—but when there is no (or productive) strife, a larger number of senior professors often translates directly into more publications and more impact.

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<sup>13</sup>There are both formal and informal power relationships within organizations. For example, the executive secretary (or military headquarter staff) may have much informal power by controlling access to the executive(s). However, their formal power can be low. There are interesting issues to be raised and understood here.

<sup>14</sup>There are other drawbacks to the German system, such as the low weight of academic publications in the compensation or tenure decision.

<sup>15</sup>There is at least one area in our school currently disintegrating over a fight. Professors in this area have spent a lion share of their time fighting one another, all the way up to university disciplinary committees.

**Law** When is it optimal to assign equal power to court contestants? Currently, the practice of law (e.g., divorce) often favors the weaker party. Public agencies provide free legal representation. By encouraging the weaker party to fight, more expenses may be wasted on divorce lawyers. When is it optimal to permit class action law suits (which strengthen the formerly weaker [more dispersed] class of small claimants)? A referee has pointed out that Muslim countries have recently replaced traditional marriage rules with Western rules based on equality. My argument points out additional costs that this change has caused, and that should be weighed against the benefits: the social desire of being “fair” to both parties (which in itself might create efficiency-increasing incentives). In equilibrium, there may be an optimal balance.

**Lawyers, Organizations** Assume that there is a cost involved with becoming the lower-cost and/or more persuasive fighter. Consider the legal profession. It would be inefficient if either *everyone* or *no one* were to be a (litigation) lawyer, because similar strength causes inefficiency. A high cost of training and accrediting lawyers (tuition, time, bar exams) might be an efficient solution to induce some people to become lawyers and others not to. Consider the existence of banks: if banks are more organized<sup>16</sup> and thus more persuasive and lower-cost fighters in financial distress, *and* if there is a cost to organizing a bank, then an equilibrium might emerge in which some individuals organize into banks at a cost, whereas other individuals remain/become dispersed public creditors, and it is optimal for firms to borrow some money from banks and some money from the public.

**Warranties and Consumer Rights** Warranty claims are typically junior in bankruptcy (they “expire”). The Manville asbestos bankruptcy was designed to “help” the product victims against the usually stronger (better organized) corporation and its creditors. As a result:

An Institute for Civil Justice–Rand Corp study estimates that for every dollar paid to injured claimants, nearly two dollars are spent on litigation expenses. More specifically, of the total amount paid by producers and insurers, 37 percent was received by plaintiffs, 26

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<sup>16</sup>Becker (1983) considers the effect of dispersed group on political lobbying.



percent by plaintiff's attorneys, and 37 percent was spent by producers and insurers on defense costs.<sup>17</sup>

By making warranty claims effectively junior in corporate bankruptcy, such prolonged struggles are usually avoided.

**Financial Applications** Other financial applications may include capital structure issues, e.g., the seniority of bank debt, the power of large vs. small shareholders, the power of organized management in an LBO contest, the role of vulture funds in bankruptcy, etc.

## V Conclusion

The advantage of asymmetry in reducing conflict expenditures seems to hold for a wide class of specifications. I argued that international efforts to create a "fair and level playing field" in many ethnic conflicts may have their own costs. Aiding Kurdish freedom fighters in Northern Iraq may be "fair," but it may also escalate the total costs of conflict. Our paper does not wish to argue that aiding Kurdish fighters is wrong (or right, for that matter), or that there are not other factors at work that may serve to make aiding an efficient strategy. Instead, our paper points out one (of perhaps a number of) forces: equalizing combatants usually creates conflict costs that have to be carefully weighed by decision makers against other benefits (including conflict reducing factor) that decision makers have to identify.

This paper has also suggested a wide range of other possible applications. One can of course write models that fit each individual situation better than the generic model outlined here, and/or point out deficiencies (omitted forces) in the application of the basic *might-becomes-right* in each scenario, but I think models that are too specifically geared only to one situation may miss that there is a common force at work in all of these phenomena: that symmetrical arrangements tend to have their own costs.

In closing, I believe the argument makes common sense (once told), has interesting empirical implications, and can be surprising, thought-provoking, even controversial. I believe it offers insights into issues in the natural evolution of conflict, groups, and arrangements that magnify natural differences.

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<sup>17</sup>The primary source is Kakalik, James S, et. al., "Costs of Asbestos Litigation," Rand Corporation, Santa Monica, R-3042-ICJ, 1983, p.40. 16

## A Modeling Generalizations

The conflict literature has focused primarily on two conflict success functions: a ratio version, used above, in which success is a function only of the ratio of expenditures by the participants; and a difference function (analogous). This discusses asymmetry in the context of these two functions.

### A Model Robustness—Ratio Functions

The generic form of the ratio form is

$$\alpha = \frac{n}{f(L_a/L_b) + m}$$

The first order condition for player  $b$  is

$$\frac{\partial P_b}{\partial L_b} = - \left[ \frac{P \alpha' (L_b^*/L_a)}{L_a} \right] - c_b = 0 \quad \Rightarrow \quad \alpha' (L_b^*/L_a) = - \frac{c_b L_a}{P}$$

$$\Rightarrow \boxed{L_b^* = L_a \alpha'^{-1} \left( - \frac{c_b L_a}{P} \right)}. \quad (1)$$

The first order condition for player  $a$  is

$$\frac{\partial P_a}{\partial L_a} = - \frac{L_b \alpha' (L_b/L_a^*)}{L_a^2} - c_a = 0.$$

In equilibrium, we can substitute for  $L_b$  in the  $\alpha'$  function with  $L_b^*$  from (1):

$$\frac{\partial P_a}{\partial L_a} = - \frac{L_b^* \alpha' \left[ \frac{L_a \alpha'^{-1} \left( - \frac{c_b L_a}{P} \right)}{L_a} \right]}{L_a^{*2}} - c_a = 0$$

$$\Rightarrow \boxed{L_a^* = \frac{c_b L_b^*}{c_a}}. \quad (2)$$

Now, return to the  $L_b^*$  solution, and substitute the first  $L_a$  (before the alpha function) from (2)

$$L_b^* = \frac{c_b L_b}{c_a} \alpha'^{-1} \left( - \frac{c_b L_a}{P} \right) \Rightarrow \boxed{L_a^* = - \frac{\alpha' (c_a/c_b)}{c_b} P}.$$

And because (1) defines the relation between  $L_a$  and  $L_b$ ,

$$\Rightarrow L_b^* = -\frac{\alpha'(c_a/c_b)}{c_b} \left(\frac{c_a}{c_b}\right) P.$$

Waste at the pair  $L^* = \{L_a^*, L_b^*\}$  is therefore

$$W(L^*) = c_a \left(-\frac{P\alpha'(c_a/c_b)}{c_b}\right) + c_b \left(-\frac{c_a P\alpha'(c_a/c_b)}{c_b^2}\right)$$

$$\Rightarrow W(L^*) = -2\alpha'(c_a/c_b) \left(\frac{c_a}{c_b}\right) P$$

This form makes it easy to derive the classes of functions for which asymmetry minimizes waste.

**Algebraic Example 1:** First, we confirm the solution above. If  $\alpha(x) = \frac{1}{1+mx}$ , then  $\alpha'(x) = -\frac{m}{(1+mx)^2}$ . It follows that

$$L_a^* = \frac{\frac{m}{(1+m(c_a/c_b))^2}}{c_b} P = \frac{m}{[1+mc_a/c_b]^2 c_b} P = \frac{mc_b}{(c_b+mc_a)^2} P$$

$$L_b^* = \frac{c_a \left\{ \frac{m}{[1+m(c_a/c_b)]^2} \right\}}{c_b^2} P = \frac{c_a m}{(1+mc_a/c_b)^2 c_b^2} P = \frac{mc_a}{(c_b+mc_a)^2} P$$

and

$$W^* = -2 \left\{ -\frac{m}{[1+m(c_a/c_b)]^2} \right\} \left(\frac{c_a}{c_b}\right) P = 2 \frac{c_a c_b m}{(c_b+mc_a)^2} P$$

$$W^* = \frac{2m}{R(1+m/R)^2} P,$$

where  $R \equiv c_b/c_a$ .

**Algebraic Example 2:** We can now consider the more general CSF with a decisiveness parameter  $\lambda$ : if  $\alpha(x) = \frac{1}{1+mx^\lambda}$ , then  $\alpha'(x) = -\frac{\lambda mx^{\lambda-1}}{(1+mx^\lambda)^2}$ , and

$$W^* = -2 \left\{ -\frac{\lambda m (c_a/c_b)^{\lambda-1}}{(1+m(c_a/c_b)^\lambda)^2} \right\} \left(\frac{c_a}{c_b}\right) P = 2 \left\{ \frac{\lambda m (c_a/c_b)^\lambda}{[1+m(c_a/c_b)^\lambda]^2} \right\} P$$

$$W^* = \frac{2\lambda m}{R(1+m/R)^2} P,$$

where  $R \equiv (c_b/c_a)^\lambda$ . It is now easy to compute comparative statics. As  $m$  goes to infinity or 0, waste goes to zero. (That is, differences in persuasiveness (terrain) reduce societal waste.) As  $R$  goes to infinity or zero, waste goes to zero. (That is, differences in conflict cost reduce societal waste.) Finally, waste is highest if  $m = R$ . That is, if terrain neutralizes conflict costs—loosely speaking if the weaker fighter is more persuasive—waste is maximized. (It is also easy to consider a case of reversing identity.)

One can further show that the conditions on functions of the form

$$\alpha = \frac{n}{f[(a + L_a)/(b + L_b)] + m}$$

are similar to those discussed above. However, this derivation is omitted for the sake of brevity in this proposal.

## B Model Robustness—Exponential/Difference Functions

The CSF difference form is

$$\alpha(L_a, L_b) = \frac{e^{E_a k L_a}}{e^{E_a k L_a} + e^{2E_b k L_b}}.$$

With constant resources to be fought over and fighting-self-financing, the objective function is

$$P_a = \alpha(L_a, L_b) \cdot V - (c_a L_a) = \frac{e^{E_a k L_a}}{e^{E_a k L_a} + e^{E_b k L_b}} \cdot V - (c_a L_a).$$

As will be shown below, in equilibrium, one of the two contestants (the less effective or higher priced contestant) typically purchases no fighting whatsoever. Thus, setting  $L_b^* = 0$ , the FOC of player  $a$  can be

$$\frac{\partial W}{\partial L_a} = -c_a - \frac{e^{2e_a k L_a} e_a k V}{(1 + e^{e_a k L_a})^2} + \frac{e^{e_a k L_a} e_a k V}{1 + e^{e_a k L_a}}$$

which can be solved into

$$L_a^* = \frac{\log \left[ e_a k V - 2c_a + \sqrt{e_a k V (e_a k V - 4c_a)} \right] - \log(2c_a)}{e_a k}$$

To show that this is a (local) equilibrium, we need to verify that player  $b$  does indeed not wish to put up any resistance, i.e.

$$\left. \frac{\partial P_b}{\partial L_b} \right|_{L_b=0} < 0,$$

where  $P_b$  is  $[1 - \alpha(L_a, L_b)]V - c_b L_b$ . Differentiating, and setting  $L_b = 0$  gives

$$-c_b + \frac{e^{e_a k L_a} e_b k V}{(1 + e^{e_a k L_a})^2}.$$

Substituting  $L_a^*$  for  $L_a$

$$-c_b + \frac{2c_a e_b k V \left[ -2c_a + e_a k V + \sqrt{e_a k V (-4c_a + e_a k V)} \right]}{\left[ e_a k V + \sqrt{e_a k V (e_a k V - 4c_a)} \right]^2}.$$

Setting this to zero simplifies to

$$e_a c_b = c_a e_b.$$

In other words, if  $e_a c_b > e_b c_a$ , then player  $B$  indeed decides to spend nothing, and we have a local equilibrium. (At the knife edge, i.e., if instead  $e_a = e_b$  and  $c_a = c_b$ , we can compute the FOC, and set  $L_a^* = L_b^*$  [the two players are equal; ergo, they should decide on the same action]. The FOC turns out to be  $-c_a + \frac{e_a k V}{4}$ , and all instances of  $L_a$  and  $L_b$  have vanished. So the solution is “undefined.”)

Refer now to the player who expends fighting energy as “the aggressor.”

$$W^* = c_a L_a^* + c_b L_b^* =$$

$$W^* = \begin{cases} \frac{c_a}{e_a k} \left\{ \log \left[ e_a k V - 2c_a + \sqrt{e_a k V (e_a k V - 4c_a)} \right] - \log [2c_a] \right\} & \text{if } e_a c_b > e_b c_a \\ \frac{c_b}{e_b k} \left\{ \log \left[ e_b k V - 2c_b + \sqrt{e_b k V (e_b k V - 4c_b)} \right] - \log [2c_b] \right\} & \text{if } e_a c_b < e_b c_a \end{cases}$$

- Note that if player  $a$  is the aggressor, waste does not depend on  $c_b$  or  $e_b$ . Indeed, the aggressor just concentrates on himself, ignoring the other player’s parameters altogether.
- Two asymptotic comparative statics are easy: As  $e_a$  goes towards infinity, waste goes to zero. As  $c_a$  goes towards zero, waste goes to zero.
- Unfortunately, some comparative statics of waste are rather complex. If player  $a$  is the aggressor, as  $c_a$  increases,  $L_a$  decreases—however, waste can increase. Eventually, as  $c_a$  becomes larger and larger, player  $a$  gets to and then sticks to 0 aggression and player  $b$  becomes the aggressor.
- There is no meaningful analysis as  $e_a$  goes towards 0 or  $c_a$  goes towards infinity, because then  $e_b$  and  $c_a$  matter.
- The following conclusion is appropriate: *fighting waste is minimized if one of the contestants becomes an extremely good fighter (high effectiveness, low cost). It is irrelevant whether the*

*other contestant is a good or a bad fighter.* (In an alternative universe, in which contestants can first invest resources to become good fighters, it would be inefficient to build two good fighters—instead, nature/the-system would prefer building one very efficient and one very inefficient competitor.)

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