

# Where Nations Fight

## Capabilities, Interests and Contiguity in Interstate Disputes\*

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24 September 2011

### Abstract

Much has been written about why nations fight. Less attention has been devoted to explaining where countries exert and endure militarized violence. A simple game theoretic bargaining model that takes into account both the onset and location of disputes identifies differences in how capabilities and national interests affect each stage of a contest. National capabilities, which are generally thought to explain the *why* of conflict, may actually do more to determine *where* disputes occur. In contrast, the model predicts that the compatibility or incompatibility of preferences is much more salient for conflict onset or initiation. The model also helps to unravel a longstanding debate about why proximate countries fight more often. Neighbors have both greater opportunity and possibly increased willingness to fight. Using data on the location of militarized disputes, I show that capabilities matter for where countries come into conflict, while interest affinity best predicts whether contests occur. The effects of contiguity on the onset and location of disputes suggests that neighbors are disproportionately willing to fight.

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\*An earlier draft of this paper was presented at the First Annual Conference of the European Political Science Association, Guinness Storehouse, Dublin, Ireland, June 16-18, 2011. I thank Alex Braithwaite, Daina Chiba and Nils Weidman for comments. A *STATA* “do” file that replicates the analysis will be made available upon publication.

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# 1 Introduction

Much has been written about why nations fight. Considerably less attention has been devoted to the question of where countries confront one another with force. The focus on onset rather than location is intuitive and reasonable. However, studying where states fight could potentially contribute measurably to unraveling the causes of war, given that much remains to be discovered. Indeed, as the results here suggest, variables widely thought to account for the *why* of war prove far more effective in explaining *where* contests occur. Capable countries use force farther from home, but they are not much more likely to fight than weaker states, once interests are taken into account.

This study explores the determinants of where nations fight. I also examine the effects of location on conflict more generally. Shifting the focus to this less conventional dependent variable makes it easier to differentiate the relative contributions of interests and material power to the advent of war. Research of the causes of conflict has consistently shown that geographic proximity is associated with increased conflict. Contiguity is the largest and most robust “cause” of interstate conflict in standard statistical models. Yet, it remains unclear what contiguity represents. Neighbors may fight because it is physically easier for them to do so, or because proximity increases interaction, augmenting tensions that occasionally precipitate warfare. While distance diminishes conflict, contiguity continues to have an independent effect, suggesting that at least some of the impact of proximity results from the generation of incompatible interests. This in turn implies the need in future research to adopt more sophisticated ways to conceptualize and measure national interests.

Unraveling the impact of contiguity on conflict also begins to address the respective effects of motive and opportunity more broadly. While capabilities determine whether warfare is possible between two nations, interests matter more in differentiating dyads that could fight (but will not) from those that may in fact resort to force. Capabilities have a considerable effect on the location of actual contests. Interests play almost no role in determining where states fight, but they have a substantial impact on whether disputes occur. I use a formal game theoretic bargaining model to decipher and illustrate the contrasting effects of capabilities and interests on whether and where states fight. I then test these claims using both one- and two-stage regressions. While capabilities and interests are each associated with warfare, these factors operate in considerably different ways.

## 2 Literature: The Importance of Being Proximate

Geographic proximity has consistently been identified as one of the most significant and substantial empirical predictors of conflict in statistical tests in the literature (c.f., Bremer 1992, Hensel 2000). Arguments involving the proximity of potential opponents typically fall into one of two categories, what Diehl (1991) and Starr (2005) refer to, respectively, as “geography as context” and “geography as cause.” This dichotomy roughly approximates that of Most & Starr (1989) in which proximity is argued to have an effect upon both the opportunity and willingness of a state to engage in conflict.

Proximity can provide an opportunity for interaction and, by extension, for conflict. Arguments associated with this theme build on cost-based logics such as Boulding’s “loss-of-strength gradient” (1962) and Zipf’s “principle of least effort” (1949) in which it is claimed that projecting power becomes increasingly inefficient with distance. Conflict is considered to be more likely “close to home,” where a nation’s own military force is most easily brought to bear (Bueno de Mesquita 1981).

Proximity can also provide states with the motive for warfare. Territorial instincts or structural hierarchies ensure that most states compete over issues that are locally defined. In this vein are arguments accounting for the generation of security dilemmas, and describing factors that influence perceptions of threat that could serve as the basis for willingness to engage in conflict (Herz 1951).

Empirical studies consistently corroborate the proposition that proximity increases conflict. They are of little value, however, in discerning the relative importance of distance as opportunity or as interest. This confusion is neatly summarized by Tir & Diehl, who ask whether territorial disputes “are more salient to decision makers and therefore more dangerous than disagreements over other issues” or whether “contiguity indicate[s] merely that there is greater spatial opportunity for interactions between states who border each other, and therefore one might expect more hostile — as well as more peaceful (e.g. trade) — interactions between neighbors” (1998, page 266).

In the effort to parse out which of these explanations is most valid, it may be useful to organize distinct claims and tests available in the literature by different levels-of-analysis. First, proximity could affect the probability of monadic conflict onset (i.e., state belligerence). Thus, increasing the number of neighbors for a state increases the probability that it will fight (Wright 1942, Richardson 1960*b*, Most & Starr 1980), perhaps by adding to decision-maker uncertainty (Midlarsky 1975).

Second, it is claimed that proximity increases dyadic conflict propensities. For instance, earlier studies consistently returned evidence of shorter average distances between warring pairs of states than non-warring states (Gleditsch & Singer 1975, Garnham 1976, Gochman 1990). Increasingly exhaustive spatial and temporal domains have been used to show that contiguity is associated with considerably heightened levels of conflict (Weede 1975, Mihalka 1976, Moul 1988, Gochman 1990) — up to 35 times more likely according to Bremer’s seminal study of “Dangerous Dyads” (1992).

Most of these studies fail to offer a direct means to differentiate propensity fueled by opportunity from that accounted for by willingness. Lemke (1995) adapts the loss-of-strength gradient to identify dyads that fall within the overlap of each state’s military capabilities as dyads most likely to experience conflict — a finding that builds primarily upon the opportunity tradition of Wesley (1962). On the other hand, Vasquez (1993, 1995) argues persuasively that human territoriality indicates that conflicts occur between neighbors most frequently over territories of mutual interest.

Third, proximity is shown to have an important bearing on regional patterns of conflict onset and diffusion. Siverson & Starr (1991) utilize the opportunity/willingness framework in order to consider the problem of contagion at the state-environment level. In particular they consider borders and alliances to be the agents of diffusion in the spread of conflict. These agents (“Warring Border Nation” [WBN] and “Warring Alliance Partner” [WAP]) are viewed as treatments that states undergo. Thus diffusion takes the form of new state involvement in war as a consequence of interaction with a warring state (infection). Similar conclusions — associating proximity between states and regional clustering of conflicts — emerge from studies by Starr & Most (1983, 1985), Kirby & Ward (1987), and Kennedy (1989). In more nuanced (and geographically-sensitive) efforts, Bremer (1992) isolates patterns of coercive contagion within regions, while Faber, et al (1984) and Houweling & Siccama (1988) demonstrate that there are short spatial and temporal distances between successive conflicts (the phenomenon occurs most notably within the same region).

Much of the continued uncertainty surrounding the most accurate theoretical account of the empirical observation linking proximity and conflict presumably comes from the varied and arguably, insufficient operationalizations of proximity that have hitherto dominated the literature. Measures employed have certainly enjoyed increasing sophistication: dominant indicators evolving

from measures of the number of borders a state has (Wright 1942, Richardson 1960*b*, Wesley 1962) to whether or not two states are contiguous (Most & Starr 1976; Bremer 1992, 1993) to a measurement of the distance between capital cities of potential opponents (Boulding 1962, Zipf 1949, Gleditsch & Singer 1975, Gochman 1990) to the requisite travel times between states (Buono de Mesquita 1981) to the distance between the territories of the two states (Ward & Gleditsch 2002). What is notable with each of these treatments of proximity, however, is that they do little more than scratch the surface of the inherent geography of conflict processes. Perhaps most troublingly, they consistently fail to address the presumably critical relationship between states and the locations of contests.

Existing studies generally place primary importance on phenomena occurring within and across the boundaries of particular states, but provide little information about the geographic context of actual contests. In other words, distance metrics are employed as measures of “state interaction,” but do not reflect the locations (i.e. longitude and latitude co-ordinates) at which conflicts take place nor, crucially, the proximity of the locus of conflict to the territories of individual states.<sup>1</sup>

Gartzke (2009) examines the interaction between national capabilities and distance. Power is an important predictor of the proximity of disputes. The approach focuses exclusively on opportunity, as selection on the dependent variable (or, rather, inability to select distances for non-disputes) makes it difficult to meaningfully discuss willingness. A series of models identify factors that affect the distance from the initiating state’s capital to the location of a MID. OLS regression (monadic and dyadic) reveals that more powerful initiator states fight further from the initiator’s capital. States with more neighbors fight closer to home. Powerful targets push initiators back closer to the initiator’s capital. These results suggest the need to examine the effect of different theoretical claims about the balance of power on the location of contests, the focus of study here.

Braithwaite (2010) assesses whether democracies ensure that the conflicts they fight are at greater distance from their home territories. Democracies are said to pay higher costs for conflict (Buono de Mesquita, et al. 2003). Democratic populations may be viewed as risk-averse, especially when it comes to the homeland. Moreover, democracy allows risk-averse populations who care about territorial integrity to select and replace leaders, influencing foreign policy decision making.

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<sup>1</sup>Notable exceptions include Braithwaite (2010), Gartzke (2009), and Braithwaite & Joyce (2009).

### **3 Theory: Where and Whether States Fight**

The causes of international conflict have been a subject of speculation and debate for centuries. Here, I discuss two related issues, the effect of location on war and the significance of contiguity.

#### **3.1 Capabilities and Interests as Substitutes and Complements**

Like crime detectives, students of international relations often conceptualize the causes of war in terms of motive (also referred to as willingness, resolve, preferences, interest or utility) and opportunity (power, capabilities or probability). The former describes factors that animate agency, making actors strive for certain outcomes, while the latter encapsulates structure, capacity or other variables that make competition more or less successful and outcomes harder or easier to achieve.

Theory and intuition encourage observers to treat these dual determinants of conflict as substitutes. A deficit in capabilities, say, can be made up with an excess of interest, just as more moderate motivation can be compensated for by greater material power. The most transparent example of substitution comes from the expected utility approach, such as that offered by Bueno de Mesquita (1981), in which the product of “probability” and “utility” is used to predict the likelihood of war.

Other scholars recognize that the ability to fight and the willingness to do so may not be pure substitutes. Most & Starr (1989) outline a framework where states must possess some capabilities and a modicum of interest in disputed issues before a contest can occur. At very low values, opportunity and willingness are complements. No amount of willingness compensates for impotence, just as power in the absence of interest fails to anticipate aggression. Once a threshold has been reached, however, nations with some convex mix of power and preference are more likely to fight.

Thus, most theories of international relations treat a nation that is highly motivated to compete and one that is particularly powerful as basically equally likely to experience war, provided there is enough of the other causal factor to make a contest possible or worthwhile. Certainly, there is no reason to expect one or the other element to predominate. Nations of unequal capabilities and/or resolve have often fought one another, if perhaps not as often as those possessing power parity (Kugler & Lemke 1996, Moul 2003), then with enough frequency to make debates over parity less than transparent (c.f., Bueno de Mesquita & Lalman 1988, Bueno de Mesquita 2003). If indeed

capabilities and interests are to some degree substitutes, then these two modes of disparity should lead to roughly equivalent predictions of conflict. Yet, this framework glosses over *how* capabilities and interests interact. In particular, proximity is arguably as important as power or preferences. It may prove useful to explore how geography affects the substitutability of motive and resolve.

It would seem obvious that capabilities increase the risk of war. One can think of arms races, for example (Richardson 1960*a*, Wallace 1979, Intriligator & Brito 1984, Sample 1997). Other approaches to international security are more equivocal, however. Increasing national capabilities might be perceived as invoking the security dilemma (Herz 1950, Jervis 1978), increasing instability and the risk of war. In contrast, greater capabilities could also increase deterrence (Snyder 1961, Wagner 1982, Mearsheimer 1983, Powell 1990), invoking stability through greater firepower. The difference in outcomes seems in particular to hinge on the intentions of actors. Put differently, capabilities by themselves are neither inherently dangerous nor benign, but have an ambiguous impact on the probability of contests. What is arguably (much) more important is whether states have reasons to exercise whatever force is available against a given opponent, for a specific purpose.

Material capabilities suggest what can happen, but do not indicate what states want. Argentina and the Netherlands were roughly equally capable in 1982 according to the Correlates of War data, but the United Kingdom fought with one and maintained an alliance with the other. The critical difference seems to have been how each state viewed its interests in relation to other nations, not capabilities. If states share common goals or interests, then no quantity of capabilities will make them likely to fight. The United States and Canada could easily engage one another in conflict, but have found no reason to do so for well over 100 years. For the majority of states with no interest in direct confrontation, power relations are not generally salient as determinants of violent conflict.

If instead nations find in one another reasons for antipathy, then the distribution of capabilities could conceivably affect the propensity to fight. Yet, the effect of material power on dispute initiation or onset is still mitigated by several factors. While inadequate capabilities could cause states to refrain from initiating contests, it does not follow that these states cannot become targets. The weak are more appealing subjects of aggression precisely because they are less able to resist. At the same time, while a total lack of capabilities axiomatically prevents one from fighting, sovereignty

generally coincides with at least a modicum of power, enough to allow a response to aggression if an opponent is accommodating enough to bring war to the weaker nation's borders. Conversely, while predominant power would appear to predestine victory, recognition of the lopsided nature of a contest will often lead the opponent to accommodate the demands of its more capable counterpart. The weak may not fight, but they seldom remain unmolested long enough to cause capabilities to account for much variation in an already rare event. The strong can fight whomever they choose, but this disparity in power makes it expedient for other nations to accommodate rather than fight.

Distance constitutes yet another diminution of the impact of power on conflict. States with substantial capabilities get their way close to home. They can also project power farther afield, influencing politics in distant places. However, power projection also tends to mitigate capabilities (Boulding 1962). If the most capable states fight far from home while the weak stay close to their own borders, this will tend to reduce effective variation in the capabilities of countries (Gartzke 2009). Being powerful is necessary to pursue a distant contest, but most states can fight somewhere. The question is then whether enough variation remains in the impact of capabilities to account for interstate conflict, or whether much of this effect is experienced in terms of where nations fight.

Differences in the impact of capabilities and interests can be seen in how each enters the war calculation in a rational model of conflict. Capabilities affect the probability of victory, and possibly the cost term. Interests affect valuations for outcomes, thus determining payoffs. The appeal of fighting increases in the payoffs for winning the contest. Increasing the probability of victory can make war more appealing, but only if the valuation for the stakes is sufficiently positive to overcome any increase in costs associated with fighting, or with fighting harder. Given that all nations possess some capabilities, there should exist some level of interest divergence that would motivate conflict between any pair of states. Incompatible interests are thus necessary to fight. Capabilities would seem to be necessary, but are in fact only a constraint in some circumstances. The vast majority of nations possess enough power so that they can fight low level disputes. The greater impact of capabilities should thus be in determining where nations fight, when they do decide to go to war.<sup>2</sup>

In realist theory, states are said variously to want security or power. Presumably, this means

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<sup>2</sup>"Liechtenstein, Andorra Forced to Fight By Larger Countries," *The Onion*, Issue 45-37, September 11, 2009. <http://www.theonion.com/articles/liechtenstein-andorra-forced-to-fight-by-larger-co,2803/>.



security in some space or power to influence some region or population. Control over physical space is integral to the concept of sovereignty. By extension, the politics of nations involves securing populations or influencing places by dominating, or at least contesting, space. Variation in capabilities should have a tremendous effect on which parts of the world nations secure, and where countries can contest influence. Imbalances of power are bound to be played out in terms of where nations are able to hold sway and where their preferences are of little import. This tendency of power relations to create “shatterbelts” or “spheres of influence” (Diehl 1991, Hensel 2000) reflects the effect of space in diminishing the putative relationship between capabilities and the likelihood of war. In contrast, interests have at best a convoluted connection with the location of contests. Nations may well project power differently based on the affinity or incompatibility of their preferences, but this requires new theory and a more detailed mapping of patterns of preferences than is possible here.

The simplest interpretation of the effects of capabilities and interests is thus that capabilities primarily influence opportunity, while interests matter most for willingness. Put another way, national interests should have the greatest effect on whether states fight, while capabilities are most salient for the ability of states to overcome physical distance, determining where states fight.

### **3.2 Unraveling Contiguity**

Contiguity is at once empirically potent and clouded conceptually. Researchers cannot say whether neighbors fight more often because it is less difficult (opportunity), or because neighboring polities develop additional reasons to fight one another (willingness). The current “state of the art” is to measure geographic proximity. States are assumed to vary in their conflict propensity with the distance between national capitals or other prominent locations. A weakness in this approach is that it assumes that fighting between states takes place at one or both capitals (Correlates of War Project 2005*b*), or alternately at the closest point on two nations’ borders (Gleditsch & Ward 1999). Countries that are far apart may fight somewhere in between, while states that are close may fight at a considerable distance from each other. The effects of contiguity on opportunity are thus only crudely approximated by capital-to-capital distance or by a variable like minimum border distance.

Looking at where states fight does more than simply supplant dichotomous contiguity with

a continuous measure. In fact, distance already offers a metric indicator of proximity. As has been documented elsewhere, however, distance fails to capture all of the impact of contiguity (c.f., Diehl 1985, Senese 2005). Neighbors fight more than one would expect given the impact of proximity on capabilities alone. Researchers have naturally inferred that contiguity is itself responsible for affecting the interests (willingness) of nations in going to war (Reed & Chiba 2010). Yet, differences between distance and the locations of contests have left open the possibility that the effects of contiguity can still be explained by observable, rather than behavioral, attributes of adjoining nations. If instead the independent effects of contiguity remain after these other factors have been considered, then this would further bolster the growing suspicion that contiguity is more than mere opportunity. If in addition, it can be shown that contiguity follows similar empirical patterns to either interests or capabilities, this would further define the correlates of contiguity.

## 4 Bargaining Over Influence

The basic insight of bargaining theories is that there need be no direct relationship between motives to compete and the probability of a contest. Obvious incentives to fight lead opponents to offer accommodating bargains, which then encourage actors with less ability or willingness to fight to pretend to have high resolve, capabilities, or low costs for war, in turn forcing states to doubt one another's resolve/capabilities/costs because of ecological bluffing. War sometimes follows as much (or more) from what we do not know, as from what we can do, or want to achieve (Fearon 1995).

If bargaining has broken the neat causal chain between abilities or interests and contests, it does not follow that we no longer have need of such connections. Researchers and practitioners still seek to explain why and when war will happen. One such opportunity involves geography, whose effects on power are not themselves subject to negotiation. It is possible to illustrate the impact of location on the means of conflict more so than the motive with a simple two player take-it-or-leave-it bargaining model. Suppose that two states  $(i,j)$  possess interests represented on an issue space of unit length. For simplicity, let State  $i$  possess an ideal point at zero, while State  $j$ 's ideal point is at  $x$ ,  $0 \leq x \leq 1$ , where  $x$  represents the divergence of state interests, with larger intervals reflecting greater incompatibilities. Suppose further that the status quo fully favors  $j$ , ( $sq = x$ ).

Politics involves place as well as preferences. Imagine that in addition to the issue space ( $x$  dimension), there is also a chord representing geographic distance between national capitals ( $y$  dimension). The use of national capitals is not accidental. Influence consists of the combination of a state getting its way ( $x$  dimension) over a certain portion of territory ( $y$  dimension). Power, or the political effect of capabilities, is observed when a state pulls policies closer to its ideal point. This can be realized to a greater or lesser extent at different places on the globe. In other words, there is some tradeoff between movement along either dimension. A nation can move issues slightly closer to its ideal point along the entire range of the chord between its own and the foreign capital, or it can move issues (dis)proportionately closer to its ideal point over some portion of the chord.

This approach has a number of empirically plausible and theoretically useful implications. For example, national borders are, in effect, a stable point along the  $y$  dimension where power and interests are deemed to be in rough equilibrium for both nations. The approach thus conforms to existing insights about the relationship between power and satisfaction (Lemke 2002, Powell 1999), while incorporating a very simple, but general, conception of geography. While not explored here, borders can be further reinforced as focal points, particularly if the frequent re-assessment of the balance of power and interests is costly (Goemans 2006). Tying together interests and space also helps to account for the apparent compactness of political geography. If power is attenuated by distance, then it is easy to see why pulling harder on  $x$  over a more limited domain could be more efficient than attempts at partial influence over a wider geographical area. By extension, sovereignty is a coordination mechanism (in effect, a log-roll among states) that limits competition and conflict along the  $x$  dimension by segmenting the  $y$  dimension between domestic and foreign.

The compactness of political geography is particularly relevant in assessing the impact on conflict of capability and interest. The attenuation of power that results from distance (i.e. the loss-of-strength gradient) tends to make states prefer getting more on the  $x$  dimension and less on the  $y$  dimension. This in turn increases the salience of interests, while doing the opposite to capabilities. More attention is paid to maximizing the tug-of-war over policies than over place. It is important to note as well that this effect is not achieved by assuming that there is any “stock” in territory *ex ante*. Since potential initiators are assumed to have none of the  $y$  dimension to

themselves at the outset, power is called on to assert its maximum effect. If instead the distribution of territory ( $y$ ) were to carry over to subsequent rounds of a multi-round game, the effect of capabilities would tend to become “built in” to the status quo, as the discussion of borders as focal points implies. Thus, the model probably exaggerates the actual salience of capabilities for conflict.

Returning to the game, payoffs are linear in the distance of points from each state’s ideal point, and in the portion of the  $y$  space that is controlled by each state. Utilities result from a combination of outcomes and the costs involved in taking various actions in the game. The sequence of play is as follows. State  $i$  first makes a proposal for the division  $d$  of the  $x * y$  space. To simplify,  $i$ ’s proposal is only denominated in  $x$ , so that if accepted,  $j$  receives  $d * y$ , while  $i$  obtains  $(x - d) * y$ . State  $j$  can reject ( $r = 1$ ), or accept ( $r = 0$ )  $i$ ’s proposal. If its offer is rejected,  $i$  must choose between fighting ( $f = 1$ ) and backing down ( $f = 0$ ). If  $i$  backs down,  $j$  retains all of the stakes (i.e. all of the disputed  $x$  dimension and all of  $y$ ). I further assume a non-negative cost (i.e. an “audience cost”) for making a demand and not carrying through with force, if necessary ( $a, a \geq 0$ ). If instead  $i$  fights, then  $i$  wins with probability  $p$  and loses with probability  $1 - p$ , where  $j$ ’s probabilities of victory and defeat are just the converse. Each state pays a cost for fighting equal to  $c_n, n \in (i, j)$ .

War in bargaining models is closely tied to uncertainty. States could be uncertain about several factors in the model. However, selecting either capabilities or interests as the basis for uncertainty would bias assessment of their respective contributions to whether and where states fight. I therefore use a neutral third component, assuming that states have private information about their own costs for fighting ( $c_{min} \leq c_{(i,j)} \leq c_{max}$ ). Finally, if  $i$  and  $j$  fight, the initiator ( $i$ ) chooses the portion ( $z, z \leq y$ ) over which it attempts to project power. To keep things simple, if  $i$  wins ( $j$  loses),  $i$  obtains all of dimension  $x$  and as much of  $y$  as it chose to compete over in the contest. If  $i$  loses ( $j$  wins),  $j$  receives all of both dimensions (i.e.  $x * y$ ). Utility functions for each player are detailed below:

$$\pi_i = (1 - r) ((x - d) * y) + r ((1 - f) (-a) + f (p (x * z) - c_i)) \quad (1)$$

$$\pi_j = (1 - r) (d * y) + r ((1 - f) (x * y) + f (p (x (y - z)) + (1 - p) (x * y) - c_j)) \quad (2)$$

where  $r$  is  $j$ ’s decision to accept ( $r = 0$ ) or reject ( $r = 1$ )  $i$ ’s offer, and  $f$  is  $i$ ’s fight decision.

Capabilities enter the model by means of their effect on the probability of victory, through what is called a contest success function (Skaperdas 1996).<sup>3</sup> This relationship could take several forms, but useful attributes of contest success functions include monotonicity between probabilities and capabilities, probabilities bounded by zero and one, and differentiability. I adopt an approach from Rohner (2006). Let  $p$  equal the probability that  $i$  wins against a contiguous opponent  $j$ , ( $y = 0$ ):<sup>4</sup>

$$p = \frac{1}{2} + \theta (\rho_i * cap_i - \rho_j * cap_j) \quad (3)$$

where  $0 \leq cap \leq 1$  are the capabilities of each state,  $\rho$  characterizes the fighting technology for each country ( $0 < \rho < 1$ ), and  $0 < \theta < 0.5$  is a parameter representing the decisiveness of a contest.

The probability  $p$ , ( $0 \leq p \leq 1$ ), is differentiable, increasing in  $cap_i$  and decreasing in  $cap_j$ .<sup>5</sup> Interpretation is also relatively simple. Nations begin with a nominal 50/50 probability of victory. The extent to which  $p$  increases in  $cap_i$  or decreases in  $cap_j$  depends on each nation's level of military technology  $\rho$ , ( $0 \leq \rho \leq 1$ ), and on the decisiveness of military engagements  $\theta$ , ( $0 \leq \theta \leq \frac{1}{2}$ ).

Unless states possess adjacent national capitals, there is some price to be paid in simply moving capabilities to the location of a contest. Asserting influence over a territory also attenuates capabilities, as local interests seldom perfectly conform to national objectives. Boulding (1962) pioneered the analytical study of what he called the loss-of-strength gradient. Effective capabilities decline in distance. For generality, I assume that the loss-of-strength takes the following functional form:

$$cap_i = cap_{i_0} - \alpha \left( \frac{z}{y_{max}} \right) - \beta \left( cap_{i_0} * \frac{z}{y_{max}} \right) \quad (4)$$

$$cap_j = cap_{j_0} - \alpha \left( \frac{y - z}{y_{max}} \right) - \beta \left( cap_{j_0} * \frac{y - z}{y_{max}} \right) \quad (5)$$

where  $cap_{i_0}$  and  $cap_{j_0}$  represent states' capabilities under contiguity,  $y_{max}$  is the largest possible distance between national capitals, and where  $\alpha$  and  $\beta$  are exogenous parameters s.t.  $\alpha + \beta = 1$ .

<sup>3</sup>The Appendix relaxes this assumption, allowing capabilities also to affect states' war costs.

<sup>4</sup>Eq. 3 is similar to a difference-form contest success function, as detailed in Hirshleifer (1989).

<sup>5</sup>A popular alternative is to use a ratio, such as  $\frac{cap_i}{cap_i + cap_j}$ , to represent contest success. However, this complicates differentiation, while Eq. 3 actually closely conforms to the approach adopted in the empirical portion of this study.

It is not clear precisely what effect distance has in attenuating power, but the two basic alternatives operate roughly like fixed and variable costs in a supply function. It could take states a fixed quantity ( $\alpha$ ) to move capabilities a given distance ( $z$ ). Alternately, it might be that the loss of strength is proportional to nominal capabilities ( $cap_0 * z$ ), subject to some conversion factor ( $\beta$ ). Equations 4 and 5 also contemplate that the two processes of attenuation operate simultaneously.

Substituting Eqs 3, 4, and 5 into Eqs 1 and 2 and simplifying yields revised utility functions:

$$\begin{aligned}\pi_i &= (1 - r) ((x - d) * y) + \frac{r}{2y_{max}} ((f - 1) (2a * y_{max}) \\ &+ f (x * z (y_{max} (1 + 2cap_{i_0} * \rho_i * \theta - 2cap_{j_0} * \rho_j * \theta) + 2\alpha * \theta (\rho_j (y - z) - \rho_i * z) \\ &+ 2\beta * \theta (cap_{j_0} * \rho_j * (y - z) - cap_{i_0} * \rho_i * z)) - 2c_i))\end{aligned}\quad (6)$$

$$\begin{aligned}\pi_j &= \frac{1}{2y_{max}} (r * x (2y (y_{max} - f * \rho_j * \theta * z (\alpha + \beta * cap_{j_0})) \\ &+ f * z (y_{max} (2cap_{j_0} * \rho_j * \theta - 1 - 2cap_{i_0} * \rho_i * \theta) + 2z * \theta (\alpha (\rho_i + \rho_j) \\ &+ \beta (cap_{i_0} * \rho_i + cap_{j_0} * \rho_j)))) - 2y_{max} (d * y (r - 1) + c_j * f * r))\end{aligned}\quad (7)$$

The game can now be solved using Bayesian Perfect Equilibrium as the solution concept. Backward inducting beginning with the “bottom” of the game tree,  $i$  first decides on the optimal distance to project power ( $z$ ), assuming that  $j$  rejects the offer ( $r = 1$ ) and  $i$  is willing to fight if necessary ( $f = 1$ ). Taking the derivative of Eq. 6 with respect to  $i$ 's choice variable,  $z$ , then setting the resulting equation  $\frac{\partial \pi_i}{\partial z} = 0$  and solving, again in terms of  $z$ , yields the optimal power projection:

$$\begin{aligned}z^* &= (2\alpha * \rho_j * \theta * y + 2\beta * cap_{j_0} * \rho_j * \theta * y + y_{max} + 2cap_{i_0} * \rho_i * \theta * y_{max} \\ &- 2cap_{j_0} * \rho_j * \theta * y_{max}) / (4\theta * (\alpha * (\rho_i + \rho_j) + \beta * (cap_{i_0} * \rho_i + cap_{j_0} * \rho_j)))\end{aligned}\quad (8)$$

Generally,  $\frac{\partial z^*}{\partial cap_{i_0}} > 0$  and  $\frac{\partial z^*}{\partial cap_{j_0}} < 0$ . For reasonable values of the relevant parameters and

variables,  $z$  is increasing in the capabilities of the initiator ( $i$ ) and decreasing in the capabilities of the target. A hypothesis relating capabilities and the location of disputes thus appears below:

**Hypothesis 1** *The distance from a nation's capital (or locus of power) to the location of a dispute is expected to increase in the state's capabilities, and decrease in the capabilities of an opponent.*

In contrast,  $\frac{\partial z^*}{\partial x} = 0$ . Interests do not appear in the optimizing equation for where  $i$  chooses to fight  $j$ . The non-relationship between interests and distance implies the following hypothesis:

**Hypothesis 2** *Interests are expected to have little or no systematic effect on where states fight.*

Figure 1 plots the effects of varying  $i$  and  $j$ 's capabilities on  $i$ 's optimal distance to a dispute ( $z^*$ ).<sup>6</sup> The left-pointing  $x$  axis represents changes in the capabilities of the initiating state ( $i$ ). Values of  $cap_{i_0}$  range between zero and 0.4, approximately the range of values for the capabilities index used in the empirical section (these are discussed later). The capabilities of the target state are measured on the right-oriented  $y$  axis. Note that values of  $cap_{j_0}$  run in the opposite direction of those for  $cap_{i_0}$ , so that large target capabilities appear nearest to the reader. The vertical ( $z$ ) axis plots the optimal distance to conflicts in values comparable to 10,000s of kilometers or miles.

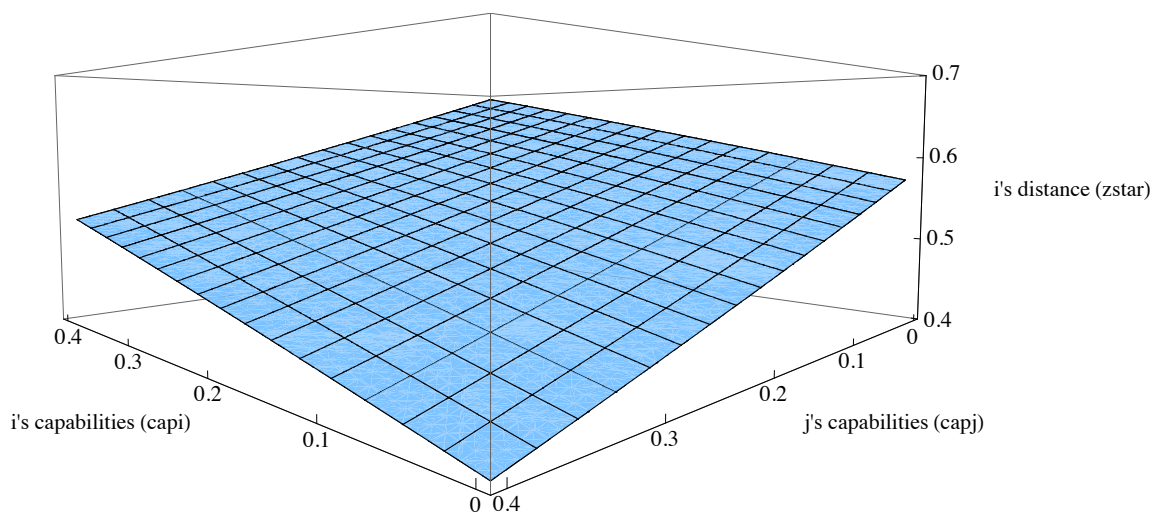


Figure 1: Theoretical Relationship between Capabilities and Where States Fight

<sup>6</sup>Figure 1 assumes that:  $r = 1$ ,  $f = 1$ ,  $\alpha = 0.75$ ,  $\beta = 0.25$ ,  $\theta = 0.5$ ,  $\rho_i = \rho_j = 1$ ,  $y = 0.625$ ,  $y_{max} = 1.25$ .

Once State  $i$  has selected an optimal distance to project power, payoffs for this best distance are compared to the payoff for not fighting. Let  $c'_i$  be defined as the cost,  $c_i$ , such that  $\pi_i^{f=0,r=1} = \pi_i^{f=1,r=1}$ . Suppose that the non-strategic actor Nature ( $N$ ) makes a random draw from a uniform distribution  $c_i \in U[c_{i_{min}}, c_{i_{max}}]$ . If  $c_i < c'_i$ , then  $i$  fights ( $f = 1$ ). Else, if  $c_i \geq c'_i$ , then  $i$  does not fight ( $f = 0$ ), accepting instead audience costs. Setting  $r = 1$  and solving  $i$ 's fight decision for  $c'_i$ :

$$\begin{aligned}
c'_i = & (4\alpha^2 * \rho_j^2 * \theta^2 * x * y^2 + 4\beta^2 * cap_{j_0}^2 * \rho_j^2 * \theta^2 * x * y^2 + 4\beta * \theta (4a (\rho_i cap_{i_0} + \rho_j cap_{j_0}) \\
& + \rho_j * x * y * cap_{j_0} (1 + 2\rho_i * \theta * cap_{i_0} - 2\rho_j * \theta * cap_{j_0})) * y_{max} + x * y_{max}^2 (1 + 2\rho_i * \theta * cap_{i_0} \\
& - 2\rho_j * \theta * cap_{j_0})^2 + 4\alpha * \theta (2\beta * \rho_j^2 * \theta * x * y^2 cap_{j_0} + y_{max} (4a (\rho_i + \rho_j) + \rho_j * x * y (1 \\
& + 2\rho_i * \theta * cap_{i_0} - 2cap_{j_0} * \rho_j * \theta)))) / (16 * \theta * y_{max} (\alpha (\rho_i + \rho_j) + \beta (\rho_i cap_{i_0} + \rho_j cap_{j_0}))) \quad (9)
\end{aligned}$$

After  $i$  has made its fight decision,  $j$  determines whether it will reject  $i$ 's offer ( $d$ ). Given that war costs are private information,  $j$  must have beliefs about  $i$ 's type. In equilibrium, these beliefs map onto the probability distribution of  $c_i$ , so that  $E(f = 1|c_i) = Prob(f = 1) = \frac{c_{i_{max}} - c'_i}{c_{i_{max}} - c_{i_{min}}}$ , where  $c'_i$  is defined in Eq. 9. Substituting  $Prob(f = 1)$  for  $f$  and  $z^*$  for  $z$  in  $j$ 's utility function (Eq 7), it is possible to solve for  $j$ 's decision. As with State  $i$ ,  $j$  has private information about its own war costs. Nature again makes a random draw,  $c_j \in U[c_{j_{min}}, c_{j_{max}}]$ . If  $c_j < c'_j$ , then  $j$  rejects  $i$ 's offer ( $r = 1$ ). Else, if  $c_j \geq c'_j$ ,  $j$  accepts  $d$ , ( $r = 0$ ). Solving  $j$ 's choice for  $c'_j$  is done in the same way as previously. However, the resulting equation is large and so to save space it is not reported here.

State  $i$  must formulate an optimal offer ( $d^*$ ). As  $i$  does not know  $j$ 's costs, it must have beliefs about the actions of each type  $j$ . Again,  $E(r = 1|c_j) = Prob(r = 1) = \frac{c_{j_{max}} - c'_j}{c_{j_{max}} - c_{j_{min}}}$ . Substituting  $Prob(r = 1)$  for  $r$  and  $z^*$  for  $z$  in  $i$ 's utility function (Eq 6), taking the partial derivative with respect to  $d$ , and solving produces  $i$ 's optimal offer. As with  $c'_j$ ,  $d^*$  is extremely cumbersome. The function is generally increasing in  $cap_j$  and  $x$ . The effect of  $cap_i$  on  $d^*$  is slightly more complex. When  $x$  is large, increasing  $cap_{i_0}$  reduces  $d^*$ , as a stronger  $i$  makes more extractive demands. When  $x$  is small, however, increasing  $i$ 's capabilities is less salient, since  $i$  and  $j$  want similar things. Formal statements of players' optimal strategies and the equilibria in the game appear in an appendix.



Finally, it is possible to calculate the probability of war in the game as the probability that  $j$  first rejects  $i$ 's equilibrium offer, times the probability that  $i$  chooses to fight rather than back down. Let  $Prob(war) = Prob(r = 1) \times Prob(f = 1) = \frac{c_{imax} - c'_i}{c_{imax} - c_{imin}} \times \frac{c_{jmax} - c'_j}{c_{jmax} - c_{jmin}}$ . The product of two long equations is of course very long, so I again omit the explicit form of this probability.<sup>7</sup>

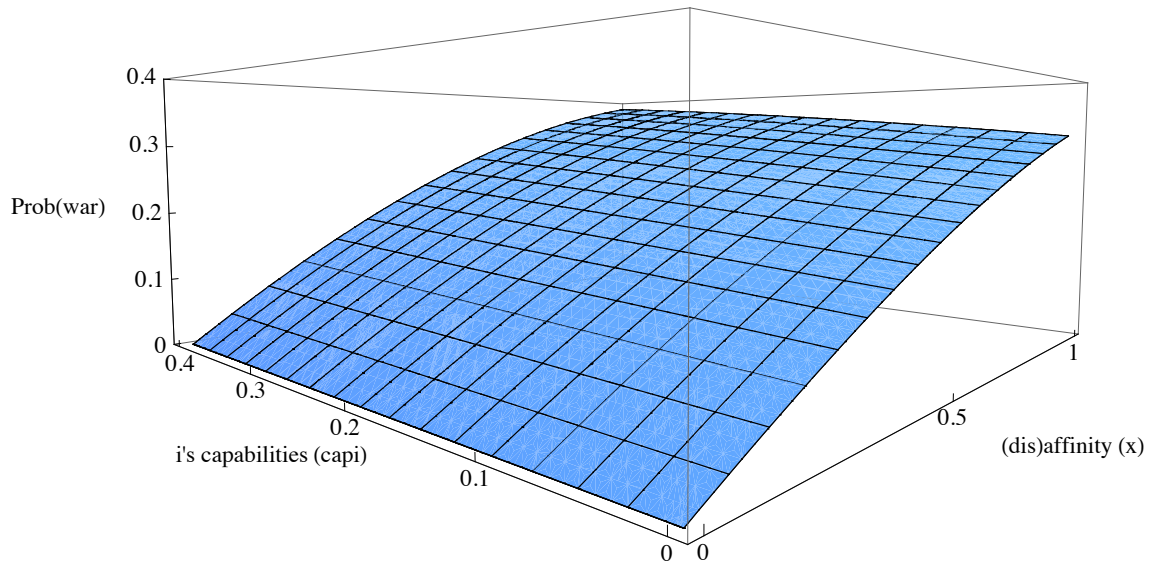


Figure 2: Theoretical Relationship between Capabilities, Interests, and Whether States Fight

Figure 2 plots  $Prob(war)$  for values of  $x$  and  $cap_{i_0}$ .<sup>8</sup> One of the first things that is apparent from the figure is that  $Prob(war)$  is increasing in  $x$ . Interests matter for whether states fight in the model in a way that was far from apparent when modeling the location of contests.

**Hypothesis 3** *Interests are expected to have a significant systematic effect on whether states fight.*

The impact of capabilities and interests on dispute onset is just the converse of that for the location of disputes. The effect of  $cap_{i_0}$  on conflict in Figure 2 is considerably more modest than the relationship between interests and conflict. While the role of material capabilities depends on parameter values, the relationship is generally modest, suggesting the final hypothesis below:

**Hypothesis 4** *A state's capabilities are expected to have little or no effect on whether states fight.*

<sup>7</sup>Detailed results of the proof and statistical analysis, including *Mathematica* code, are available from the author.

<sup>8</sup>Figure 2 is plotted based on the following variable and parameter values:  $f = 1$ ,  $\alpha = 0.5$ ,  $\beta = 0.5$ ,  $\theta = 0.5$ ,  $\rho_i = \rho_j = 1$ ,  $y = 0.625$ ,  $y_{max} = 1.25$ ,  $c_{imax} = c_{jmax} = 0.5$ ,  $c_{imin} = c_{jmin} = 0.00001$ ,  $c_i = 0.1$ ,  $cap_{j_0} = 0.01$ .

Contiguity could be related to either, neither, or both distance and interests. The effect of capabilities on contiguity is also relevant, both in overcoming distance, and in terms of any direct effect capabilities might have on where and whether states fight. To the degree that contiguity represents opportunity beyond the effects of metric distance, contiguity should mimic the effects of capabilities as identified in the formal model. In short, contiguity should be a significant determinant of where states fight more so than whether disputes occur. In addition, contiguous contests between neighbors should tend to occur at a more central location between initiator and/or target than disputes between non-neighbors with equivalent distances between capitals. The presence of an intermediate country or other “buffer,” such as a large body of water, should tend to shift contests closer to (farther from) one nation’s capital than would otherwise be the case.

**Hypothesis 5** (*Opportunity*) *Ceteris paribus, contiguity should tend to affect where states fight.*

To the degree that contiguity represents willingness beyond the nominal impact of standard measures of national affinity, the effect of contiguity on where and whether states fight should parallel the effects of interests, as predicted in the formal model. Neighboring states may interact more often, developing stronger affinities or animosities than other states with similar geographic distance between capitals, but no direct or near contact by borders or small bodies of water. If so, then, as with interests, contiguity should tend not to have a significant impact on the location of contests, since interests are not directly related to where states fight. Instead, neighbors should tend to fight more often, with little difference in where they fight beyond that predicted by distance.

**Hypothesis 6** (*Willingness*) *Ceteris paribus, contiguity should tend to affect whether states fight.*

## 5 Research Design and Data

The formal model discussed above helps to identify a number of novel relationships between capabilities, interests, contiguity and interstate conflict. I test the hypotheses developed from the model below. In particular, estimating the determinants of the location of MIDs frees up these data to reveal information about relationships that have previously been obscured or ignored. In the sections below, I check to see whether capabilities and interests act as substitutes empirically.

If the location of disputes is largely a function of geography, then a measure of distance and a variable for the size of countries should suffice to account for variation in this dependent variable. The model suggests instead that where states fight depends on a more complex set of variables. Strong states are able to project power farther from home, and thus closer to an enemy. Conversely, capable targets should be able to resist such pressure, pushing disputes closer to the initiator. I can use location to identify whether contiguity is simply a less informative measure of distance, or whether contiguity contains separate information relevant to dispute location, onset, or both.

## 5.1 Data

This study relies on data from several sources to operationalize the hypotheses and to address a variety of possible confounding variables. I discuss the sources and coding of relevant data below.

*Dependent Variables:* Braithwaite (2009) identifies the latitude and longitude of each militarized interstate dispute (MID) in the Correlates of War (COW) dataset (Gochman and Maoz 1984; Jones, et al. 1996). We use these data to assess hypotheses about the effects of capabilities and interests on the distance of disputes from national capitals. In addition, Maoz offers a version of COW MIDs (DYMID) that codes for the initiation or onset of dyadic MIDs.<sup>9</sup> These data are used separately and in conjunction with the location data in a two-stage regression to identify whether states fight.

*Capabilities:* COW offers the Composite Index of National Capabilities (CINC) based on six components: military spending and personnel, total and urban population, and iron & steel production and energy consumption (Singer, et al. 1972, Singer 1987). While these data are certainly not perfect (Leng 2002), they are the most widely used measure of capabilities in quantitative studies (c.f. Bueno de Mesquita & Lalman 1988, Bremer 1992, Maoz & Russett 1993). Data coverage extends from 1816 to 2000 (Correlates of War Project 2005a). Controversy continues about how best to measure power (c.f. Organski 1958, Schweller 1998), but there is no reason to believe that these data necessarily bias in favor of the hypotheses here (Singer 1963; Wayman et al. 1983). I include variables for each state's CINC score and for the dyadic interaction between CINC scores.

*Affinity:* It is difficult to operationalize state interests. I use an index based on annual voting

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<sup>9</sup>The DYMID codebook is available at: <http://psfaculty.ucdavis.edu/zmaoz/>. We use data from *EUGene*.

patterns in the United Nations General Assembly (Gartzke & Jo 2002). The index reports the similarity of votes for pairs of states, using the “S” coding (Signorino & Ritter 2001). Values in these data range from one (“most similar”), to negative one (“least similar”). In order to conform as closely as possible to the theoretical model, I rescale these data by adding one, dividing by two and subtracting the result from one. This produces a measure of policy (dis)similarity over the unit interval ( $x$  in the theoretical model), where zero is most similar and one is most different.

*Geographic Contiguity and Distance:* States that are far apart are generally less likely to fight each other (Bremer 1992, Maoz & Russett 1992, Buhaug & Gleditsch 2006). Rather than conflate the effect of geographic distance with where states fight, I add a standard measure of distance between capitals to the regressions. Capital-to-capital distance is naturally correlated with the distance between either capital and the location of a MID. To the degree that my argument is weak or invalid, the distance variable will tend to mitigate against the significance of relevant hypotheses.

I also include a measure of contiguity that codes the proximity of land borders and the distance separating countries by bodies of water. The contiguity variable is expected to increase MID likelihood while distance should decrease militarized disputes and wars (Diehl 1985, Senese 2005). Including both contiguity and distance makes it possible to distinguish the effects of contiguity from distance or MID location. Results for other variables do not depend on the presence of contiguity.

*State Size:* For various reasons, nations that are geographically larger may end up fighting farther from their capitals. To address this, I include a variable measuring the territory of each country on an annual basis (in 1000s of square kilometers) from Lake and O’Mahony (2004, 2006).

*Military Alliances:* Alliances are formal agreements intended to affect conflict. Alliances also overcome distance by creating opportunities for security partners to share territory. For these reasons and others, I include a measure of the presence of an alliance in a given dyad year based on the COW alliance data (Singer and Small 1966; Small and Singer 1990; Gibler and Sarkees 2004).

*Major Power Status:* Powerful countries are more active internationally, leading to more conflict. The major power variable is a dummy coded “1” if at least one state in a dyad is a major power according to the COW list. Since the variable confounds some of the distinctions the study makes between interests, power and distance, I exclude major power in some of the econometric models.

*Democracy:* I construct annual democracy scores for each state as the difference between the Polity IV project’s DEMOC and AUTOC variables (Jagers & Gurr. 1995). I also include an interaction between monadic regime scores to capture non-linearities, such as the democratic peace.

*Temporal Splines:* A well-established problem in Time-Series–Cross-Section Analysis (TSCS) is the non-independence of observations. Beck et al. (1998) recommend the use of a matrix of lagged dependent variables to control for temporal dependence. This approach has become the standard in the literature. In addition to peace years, I use four “spline” variables for each dependent variable.<sup>10</sup>

## 6 Results

The effects of capabilities, interests and contiguity on the advent and location of contests vary depending on model specification and other factors. In general, however, the results below are indicative of findings using a wide variety of alternative model specifications and variable constructions. Capabilities are most salient for determining the location of contests, while interests and contiguity independently influence whether states fight. Results are arranged in three tables. The first table addresses location, while Table 2 models causes. Table 3 combines the two stages.

The first regression in Table 1, labeled “Initiator,” predicts the distance from the location of a MID to the capital of the initiating state. The statistical model is intentionally a very simple specification. Only the CINC capability scores of the two states in the dyad and the distance between capitals are included. All three independent variables are highly significant in appropriate directions. As predicted by hypothesis 1, the more capable the initiating state (State A), the farther is the location of the MID from the initiator’s capital. Conversely, the more capable the target (State B), the closer the MID occurs to the initiator’s capital city. While the distance between the capitals of the disputants is quite reasonably a significant determinant of the distance from the initiator to the MID, distance does not explain away the effects of capabilities on dispute location.

The second column of coefficients and standard errors, labeled “Target,” reflects three changes. First, the distance measured by the dependent variable is from the target capital to the location of the MID. As expected, the signs on CINC score coefficients reverse themselves when using the

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<sup>10</sup>Coefficients and standard errors for spline variables are not reported since they lack a substantive interpretation.

Table 1: Effect of Opportunity and Willingness on Where States Fight (OLS, MID Locations)

Distance to MID <b>Variable</b>	<b>Initiator</b> Coeff (S.E.)	<b>Target</b> Coeff (S.E.)	<b>Affinity</b> Coeff (S.E.)	<b>Non-linear</b> Coeff (S.E.)	<b>Kitchen Sink</b> Coeff (S.E.)
CINC <sub>A</sub>	16349.6 *** (1592.9)	-12118.7 *** (1660.4)	17723.2 *** (3447.4)	17980.6 *** (3716.6)	-15324.2 *** (3265.7)
CINC <sub>B</sub>	-6107.4 *** (1443.9)	14916.8 *** (1702.6)	-20927.2 *** (3231.4)	-20669.7 *** (3497.3)	12479.4 *** (3727.3)
CINC <sub>A</sub> × CINC <sub>B</sub>				-3295.2 (50588.4)	-11505.1 (47127.7)
Affinity			-408.6 (600.5)	-423.8 (585.4)	-479.8 (587.3)
Contiguity		338.0 (235.4)	352.1 (249.5)	397.6 (287.9)	343.0 (273.0)
Distance	0.705 *** (0.059)	0.762 *** (0.077)	0.824 *** (0.100)	0.831 *** (0.105)	0.837 *** (0.099)
State Size <sub>A</sub>		7525.2 *** (1771.4)	2602.2 (4188.6)	2962.5 (4822.8)	9275.9 *** (2848.2)
State Size <sub>B</sub>		3644.3 (3223.5)	13424.6 *** (2625.5)	13784.9 *** (2770.0)	7748.6 (4817.4)
Size <sub>A</sub> × Size <sub>B</sub>				-10981.5 (88044.4)	-8866.3 (85074.9)
Alliance					36.35 (119.2)
Democracy <sub>A</sub>					-59.25 † (28.23)
Democracy <sub>B</sub>					94.36 *** (27.25)
Dem <sub>A</sub> × Dem <sub>B</sub>					-1.853 (4.250)
Energy/Pop. <sub>A</sub>					-39.74 † (17.40)
Energy/Pop. <sub>B</sub>					13.16 (16.87)
Energy <sub>A</sub> × Energy <sub>B</sub>					67.44 (115.3)
Intercept	595.2 *** (60.73)	230.6 (221.3)	209.8 (238.0)	153.3 (291.5)	92.79 (333.9)
N	5081	4237	2480	2480	2474
R <sup>2</sup>	0.468	0.493	0.553	0.553	0.576
F	138.72	60.26	72.01	63.71	44.78

Significance levels : † : 5% \* : 1% \*\* : 0.5% \*\*\* : 0.1%

target-to-MID location. As again expected by hypothesis 1, capable initiators generate MIDs that occur closer to the target, while capable targets force the fight farther from their own capital. Second, the “Target” regression adds the *Contiguity* measure. MIDs between contiguous states are not statistically closer or farther away than MIDs between non-contiguous states. This pattern continues throughout the analysis. A non-relationship indicates rejection of hypothesis 5 (the opportunity hypothesis). Contiguity may capture some effects of distance, but in regressions designed to predict dispute proximity, contiguity provides no more information than simple distance.<sup>11</sup>

The third change to the second regression model in Table 1 involves the addition of monadic variables for the size of each country’s territory. It could be that more capable countries appear to be fighting at greater distance simply because powerful states hold more territory. This does not appear to be the case, as both distance and the two capability variables remain statistically significant in the predicted direction. Strangely, it is the size of the initiating state (not the target) that is significantly and positively related to the distance between the capital city of the target and location of a dispute. This suggests that the intuition that territorial size determines the location of disputes is not quite correct. Rather than affecting the location of contests relative to their own capital, large countries *increase* the distance from a dispute to their opponent’s capital.

The middle regression in Table 1 returns to using the distance to the initiator’s capital as the dependent variable. This “Affinity” regression also adds the measure of national interest similarity. As anticipated by hypothesis 2, the interest variable is not remotely statistically significant in estimating the location of militarized disputes. *Affinity* has no effect on where states fight. A more remarkable change occurs in the variables for national geographic size. Note that *State Size<sub>A</sub>* is no longer statistically significant, while its counterpart for the target state is now highly significant. The fact that the target variable is significant when using the distance to the initiator’s capital as the dependent variable, and vice versa, and that the relationship is positive, suggests again that state size is capturing novel aspects of national capabilities, rather than just measuring geography.

I next plot the effects of capabilities and affinity on the location of contests based on the “Affinity” regression. Figure 3 reports marginal effects varying *CINC<sub>B</sub>* from minimum to maximum,

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<sup>11</sup>Regressions that do not include distance confirm this, reporting a positive and significant effect for contiguity.

with  $CINC_A \times CINC_B$  adjusted accordingly. All other variables are held at their median values.

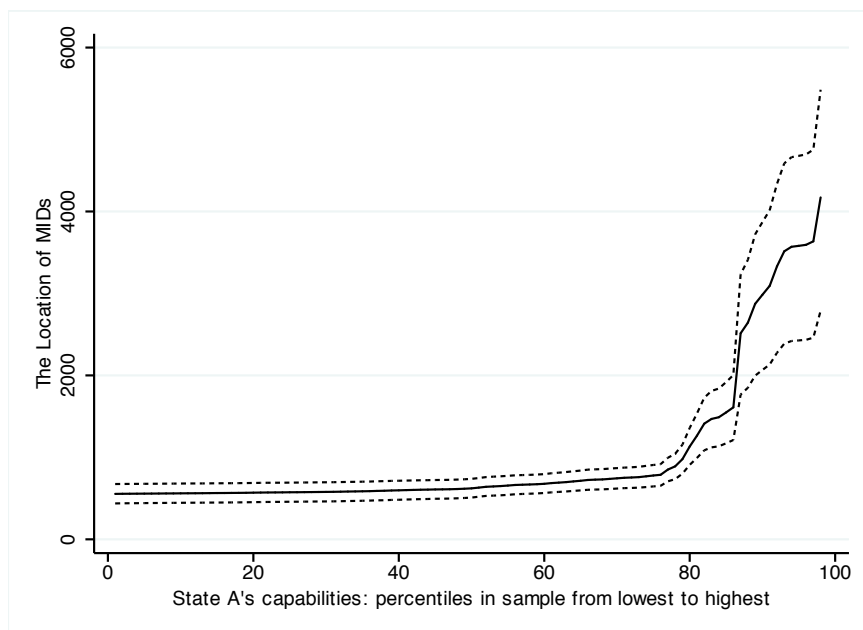


Figure 3: Empirical Relationship between Capabilities and Where States Fight

While average distance increases throughout the range of values, states with the highest capabilities tend to fight much farther from home. Results from the theoretical model pictured in Figure 1 appeared to anticipate a more steady monotonic increase in MID location resulting from rising capabilities. The discrepancy can be explained by the fact that the theory does not anticipate the distribution of capabilities in the population of countries. The horizontal axis in Figure 3 sorts capabilities by percentiles. Since the distribution of CINC scores is skewed (many weak states and far fewer very powerful states), the effect of plotting by percentiles is to compress values at the top end, exaggerating the slope of the function relating highly capable states to MID location.

A similar effect occurs in plotting policy affinity. For this reason, I log values of the affinity variable plotted in Figure 4. As anticipated by hypothesis 2, there is essentially no effect of variation in *Affinity* on where states fight. However, the confidence intervals surrounding the estimated relationship for high values of the interest variable, where dyadic interests are most dissimilar, are much larger, due again to percentiles compressing values in regions with fewer observations.

The final two columns in Table 1 offer robustness checks of the basic findings for where states



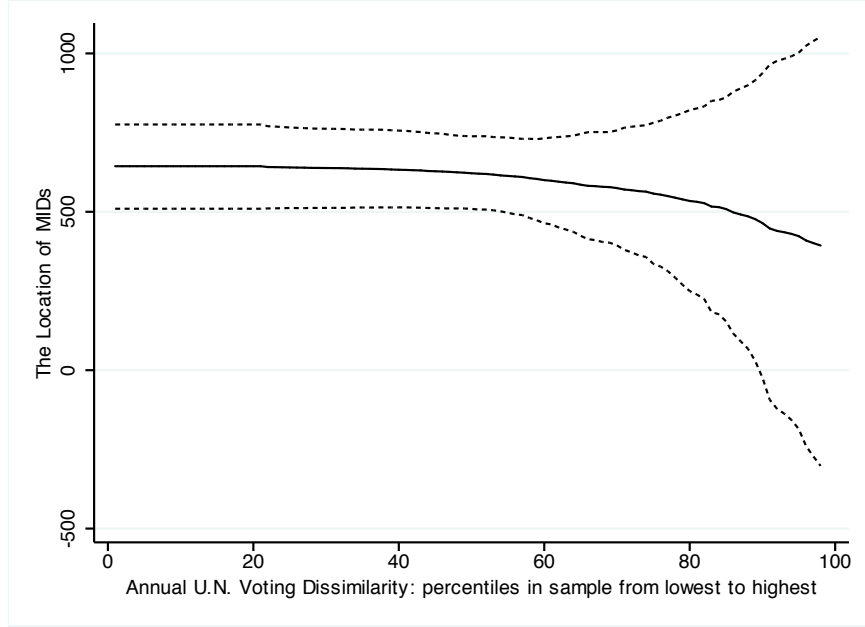


Figure 4: Empirical Relationship between Interests and Where States Fight

fight. The “Nonlinear” regression adds estimated coefficients and standard errors for interactions between each set of monadic variables (capabilities and state size). Dyads imply strategic interaction that could potentially bias estimates of these variables. Neither  $CINC_A \times CINC_B$  nor  $Size_A \times Size_B$  are statistically significant, while the monadic variables are all almost completely unchanged.

Table 1 finishes with a “Kitchen Sink” regression designed to address a variety of possible confounding causal factors. Included variable bias is no better than omitted variable bias (Clarke 2005), but the objective here is simply to confirm previous results. This last regression again uses the distance-to-target dependent variable. Democracies appear to prefer to fight farther from home. This is especially the case for targets, where the relationship between location is tighter given the dependent variable. Democratic initiators shorten the distance between the dispute location and the target (at the 5% level). There is no indication of an interaction effect; when it comes to the location of contests, democratic dyads are about the same as dyads containing only one democracy.

Prosperous states may behave differently from developing countries in terms of where they choose to fight. Scholars like Boulding (1978) noted the possibility that modern technological change could lead to “the death of distance” (Buhaug & Gleditsch 2006). Rather than using the

more common Gross Domestic Product, I rely on energy consumption, which is available for a longer time period and correlates closely with GDP.  $Energy/Pop_A$  modestly decreases the distance between the target and MID location, while  $Energy/Pop_B$  has no significant effect on location.

Table 2 addresses the conventional question of what leads states to fight. The sample initially involves all directed dyad years from 1816 to 2000, but later drops to just the post-war period due to data availability.<sup>12</sup> Five regressions are again reported, distinguished by model specification and whether the dependent variable involves the initiation or onset of a MID. The first model (“Basic”) includes just monadic CINC scores and distance, plus the peaceyear and spline variables (not reported) and the intercept. Consistent with conventional wisdom, the capabilities of initiators and targets significantly increases MID initiation. Distance is negatively associated with conflict.

Adding *Affinity* to the basic regression leads the respective capabilities variables to reverse their significance. Monadic CINC variables are no longer statistically significant in this or subsequent regressions. Instead,  $CINC_A \times CINC_B$  becomes significant, while remaining positive. *Affinity* itself is positive and highly statistically significant, indicating that differences of interests among states are associated with a significant increase in dispute initiation. Other variables remain largely unaltered, although major power status for the target state is now statistically significant.

The “Controls” regression adds measures of monadic and dyadic regime type and economic development. All three democracy variables are statistically significant, with monadic democracy appearing to increase dispute initiation, while democratic dyads are significantly less dispute prone. Developed initiators are no more or less likely to fight, but developed targets are more likely to be attacked, suggesting that developed states are easier or more lucrative prey. However, the interaction between states is negative, while the six new variables do not alter the basic results.

The fourth regression in Table 2 estimates the probability that State A and State B experience a MID onset. Use of the non-directed onset variable does not alter any of the key results, suggesting that directionality (i.e. differentiating the initiator from the target) is not as critical in studying causation, as indeed the theoretical model suggests. Both monadic capabilities variables remain statistically insignificant, while the interaction between monadic CINC scores continues to show

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<sup>12</sup>For obvious reasons, United Nations voting data are only available for the post-World War II period. Results for the first two regressions in Table 2 (“Basic” and “Controls”) are similar when the sample is restricted to 1945-2000.

Table 2: Effect of Opportunity and Willingness on Whether States Fight (Probit, MIDs)

MID Initiation	Basic	Affinity	Controls	Onset	State Size
Variable	Coeff (S.E.)	Coeff (S.E.)	Coeff (S.E.)	Coeff (S.E.)	Coeff (S.E.)
CINC <sub>A</sub>	2.335 *** (0.368)	0.491 (0.666)	0.433 (0.658)	0.744 (0.605)	0.927 (0.793)
CINC <sub>B</sub>	2.477 *** (0.537)	0.924 (0.886)	0.878 (0.805)	0.744 (0.605)	0.927 (0.793)
CINC <sub>A</sub> × CINC <sub>B</sub>	4.459 (5.058)	21.29 *** (4.868)	22.34 *** (4.774)	23.87 *** (5.416)	23.62 * (8.592)
Affinity		1.207 *** (0.130)	0.998 *** (0.132)	1.127 *** (0.119)	1.240 *** (0.114)
Contiguity	0.764 *** (0.097)	0.793 *** (0.117)	0.920 *** (0.114)	0.736 *** (0.101)	0.931 *** (0.095)
Distance	-0.064 *** (0.012)	-0.103 *** (0.015)	-0.099 *** (0.014)	-0.124 *** (0.013)	-0.095 *** (0.013)
Alliance	-0.065 (0.041)	-0.051 (0.054)	-0.013 (0.052)	0.069 (0.041)	0.128 * (0.044)
Maj. Power <sub>A</sub>	0.414 *** (0.061)	0.458 *** (0.085)	0.505 *** (0.085)	0.483 *** (0.078)	0.560 *** (0.081)
Maj. Power <sub>B</sub>	0.138 (0.079)	0.335 * (0.105)	0.328 *** (0.095)	0.483 *** (0.078)	0.560 *** (0.081)
Democracy <sub>A</sub>			0.032 *** (0.007)	0.037 *** (0.006)	0.026 *** (0.007)
Democracy <sub>B</sub>			0.048 *** (0.008)	0.037 *** (0.006)	0.026 *** (0.007)
Dem <sub>A</sub> × Dem <sub>B</sub>			-0.007 *** (0.001)	-0.008 *** (0.001)	-0.007 *** (0.001)
Energy/Pop. <sub>A</sub>			0.0002 (0.001)	0.002 (0.001)	0.002 (0.001)
Energy/Pop. <sub>B</sub>			0.006 *** (0.001)	0.002 (0.001)	0.002 (0.001)
Energy <sub>A</sub> × Energy <sub>B</sub>			-0.071 ** (0.022)	-0.063 *** (0.018)	-0.071 *** (0.021)
State Size <sub>A</sub>					-0.670 (0.644)
State Size <sub>B</sub>					-0.670 (0.644)
Size <sub>A</sub> × Size <sub>B</sub>					-10.21 (16.83)
Intercept	-2.191 *** (0.108)	-2.070 *** (0.130)	-2.363 *** (0.121)	-1.368 *** (0.110)	-1.516 *** (0.109)
N	1,313,582	968,488	949,203	949,203	706,772
Log-likelihood	-15251.20	-7843.28	-7731.64	-15932.78	-12898.15
χ <sup>2</sup> <sub>(13,14,20,20,23)</sub>	2508.70	2355.85	2494.58	3470.36	3626.26
Pseudo R <sup>2</sup>	0.283	0.345	0.351	0.428	0.444

Significance levels : † : 5% \* : 1% \*\* : 5% \*\*\* : 0.1%

a significant increase in the risk of a MID. *Affinity* also continues to have a negative and highly significant effect. Potential initiators and targets with similar interests are much less likely to fight. Contiguity increases dispute initiation or onset, suggesting again that neighbors fight more due to interaction. As with the previous regression, the “Onset” model also includes variables for alliance and major power status, democracy and development. Results for most of these variables is similar to the “Controls” regression, with the exception that *Energy/Pop.B* is no longer statistically significant, while the development interaction is now significant at a higher critical level. The insignificance of the target state’s development level reflects the fact that the dependent variable now includes MIDs begun by either or both the initiator or target. Developing countries appear much more likely to target developed countries with disputes, while developed countries are no more likely to initiate a dispute, and much less likely to fight each other (a developmental peace).

The final regression in Table 2 simply adds the state size variables to the previous statistical model. In most cases results remain unchanged, with one important exception. While the coefficient on the interaction of CINC scores has not changed, the standard errors are now much larger. This again suggests that state size is capturing some aspect of national capabilities, though none of the size variables are statistically significant. Pairs of powerful states appear to behave differently than other combinations of capabilities, but the difference is now less likely to be meaningful. Alliances also now increase conflict, though again the effect is at the marginal 5% statistical threshold.

Comparing coefficients and standard errors on variables that are intended to interact could be problematic. For example,  $CINC_A \times CINC_B$  may be statistically significant when holding  $CINC_A$  and  $CINC_B$  at their means, but this does not make sense in terms of the variable construction or data. By construction, all three variables co-vary. Figures 5 and 6 resolve this problem by again plotting the relationship between capabilities or interests and the dependent variable (dispute onset). The results, based on the final regression in Table 2, are the converse of those reported for location. Varying capabilities does not significantly change the probability of experiencing a MID. While nations with the highest material capabilities (above 95%) appear more dispute prone, the effect is not statistically significant. In contrast, the effect of U.N. voting is monotonically increasing in larger policy differences, with tight confidence intervals around the estimated relationship.

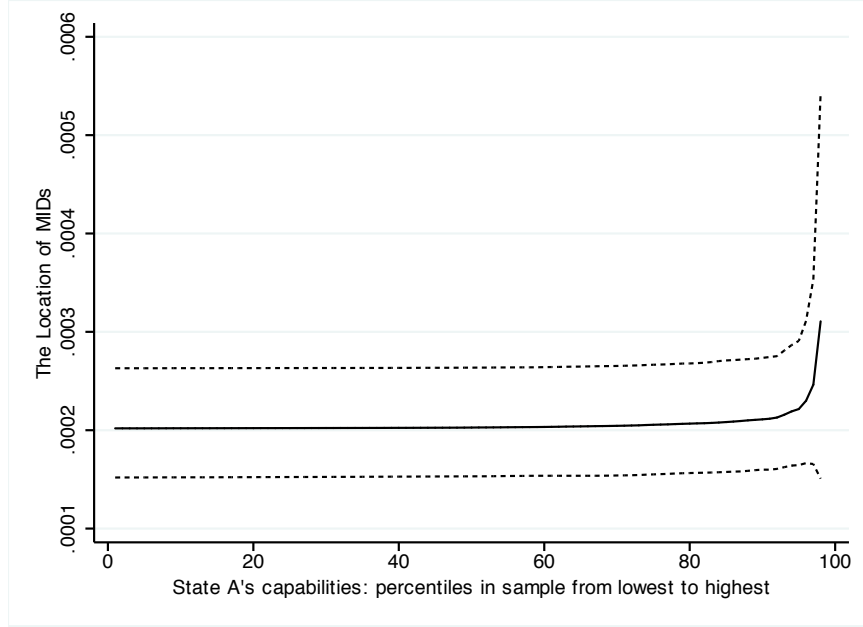


Figure 5: Empirical Relationship between Capabilities and Whether States Fight

The location of a contest may not be independent of whether a contest occurs. The distinctive findings for capabilities and affinity or contiguity could potentially result from unobserved interactions between the “whether” and “where” portions of the analysis. Table 3 addresses this possibility. The objective is to determine whether to accept the claim that capabilities largely determine where states fight, while interests substantially only influence whether disputes occur. Contiguity diverges from distance in influencing states’ motivation for war. To assess potential errors due to selection and other processes, I next evaluate both stages of conflict together using the Heckman two-stage estimator, which allows for the possibility that the “whether” stage is biasing the estimation of “where” results. An initial check of this possibility suggests that this it is not the case. The  $\rho$  parameter estimating the link between coefficients in the two stages is small and not significant for all four models in Table 3. Thus, regressing the “where” stage by itself does not produce biased estimates for capabilities, interests, contiguity and other variables. On the other hand,  $\sigma$  is positive and significant in all four models; separating the stages artificially reduces standard errors in estimating where states fight. Correcting these standard errors does not appear to degrade the statistical significance for any of our key variables in any meaningful way.

Table 3: Two-Stage Models of Dispute Initiation or Onset and Location (Heckman, Directed Dyads)

Variable	Initiator		Basic Model		Target		Interaction		Kitchen Sink	
	Coeff	(S.E.)	Distance to Initiator	Coeff	Distance to Target	(S.E.)	Coeff	Distance to Target	Coeff	Distance to Initiator
Equation 1:										
CINCA	31419.3 ***	(3572.6)	-21162.6 ***	(4987.2)	-20091.8 ***	(5620.5)	27205.1 ***	(6917.5)		
CINCB	-12627.9 ***	(3201.6)	24777.9 ***	(6125.6)	25849.9 ***	(6472.6)	-15167.7 **	(5534.3)		
CINCA × CINCB					-10197.1	(66352.4)	70587.4	(64850.7)		
Affinity	609.7	(1029.7)	-226.7	(876.7)	-345.6	(860.5)	453.0	(1000.3)		
Contiguity	-141.9	(556.2)	480.7	(509.1)	744.0	(592.0)	738.0	(526.6)		
Distance	0.451 **	(0.146)	0.775 ***	(0.155)	0.813 ***	(0.166)	0.541 ***	(0.132)		
State SizeA			9.878 †	(4.169)	12.21 *	(4.531)	4.371	(5.013)		
State SizeB			1.781	(6.435)	3.280	(6.894)	13.36 †	(5.478)		
SizeA × SizeB					-0.055	(0.109)	-0.163	(0.0975)		
Alliance							437.5	(231.8)		
DemocracyA							-10.10	(40.33)		
DemocracyB							-48.50	(38.34)		
DemA × DemB							2.562	(6.364)		
Energy/Pop.A							110.7	(56.96)		
Energy/Pop.B							14.20	(32.54)		
EngyA × EngyB							-450.9 †	(214.6)		
Intercept	237.2	(883.5)	-67.93	(733.2)	-317.1	(790.5)	-321.0	(801.3)		
Equation 2:										
CINCA	1.932	(1.844)	0.318	(1.354)	0.288	(1.259)	2.655	(1.850)		
CINCB	-0.507	(2.104)	0.885	(1.166)	0.740	(1.122)	1.928	(1.821)		
CINCA × CINCB	11.25	(8.277)	2.538	(6.537)	4.412	(6.203)	16.69	(15.15)		
Affinity	1.896 ***	(0.273)	1.956 ***	(0.198)	1.729 ***	(0.192)	1.410 ***	(0.264)		
Contiguity	1.237 ***	(0.174)	0.859 ***	(0.161)	1.092 ***	(0.147)	1.356 ***	(0.193)		
Distance	-0.082 ***	(0.023)	-0.111 ***	(0.021)	-0.096 ***	(0.019)	-0.076 **	(0.025)		
Alliance	-0.093	(0.098)	0.107	(0.072)	0.153 †	(0.070)	-0.089	(0.099)		
Maj. PowerA	0.158	(0.266)	0.360 †	(0.171)	0.405 †	(0.162)	0.426	(0.249)		
Maj. PowerB	0.523 †	(0.253)	0.294	(0.152)	0.385 *	(0.149)	0.550 †	(0.245)		
DemocracyA					0.034 *	(0.013)	0.035 †	(0.017)		
DemocracyB					0.027 †	(0.011)	0.044 †	(0.020)		
DemA × DemB					-0.006 ***	(0.002)	-0.008 **	(0.0025)		
Energy/Pop.A					0.004	(0.002)	0.001	(0.003)		
Energy/Pop.B					0.002	(0.002)	0.004	(0.003)		
EngyA × EngyB					-0.126 ***	(0.034)	-0.055	(0.042)		
State SizeA							-0.002	(0.002)		
State SizeB							-0.003 *	(0.001)		
SizeA × SizeB							-0.000005	(0.00002)		
Intercept	-2.510 ***	(0.193)	-2.034 ***	(0.169)	-2.338 ***	(0.150)	-2.662 ***	(0.192)		
/ath ρ	0.113	(0.137)	0.029	(0.092)	0.010	(0.091)	0.046	(0.134)		
ln(σ)	7.294 ***	(0.108)	7.384 ***	(0.087)	7.380 ***	(0.085)	7.230 ***	(0.105)		
N	967,338		966,813		947,559		705,832			
Log-likelihood	-5865.74		-9848.50		-9771.57		-5397.24			
χ <sup>2</sup> (5,7,9,16)	160.16 ***		235.17 ***		349.49 ***		955.97 ***			

Significance levels : † : 5% \* : 1% \*\* : 0.5% \*\*\* : 0.1%

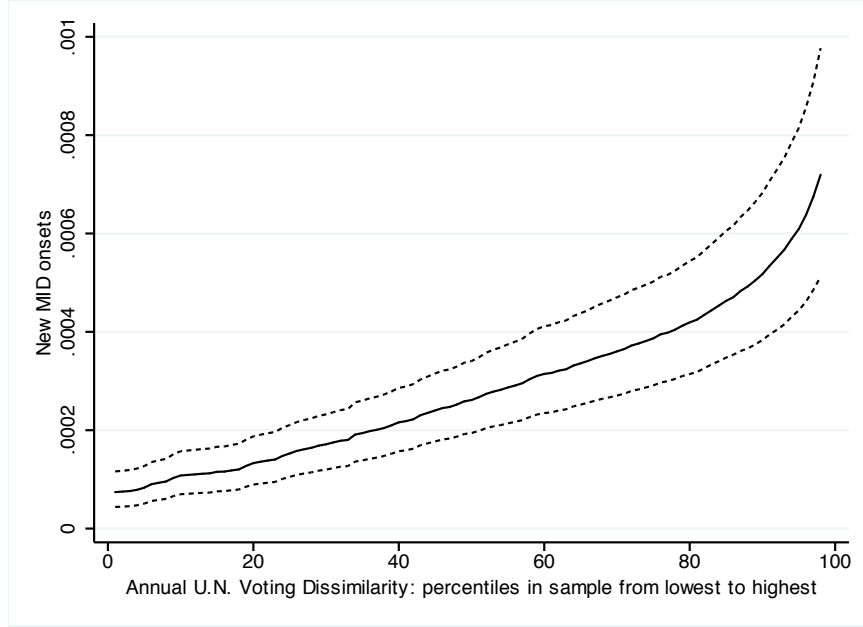


Figure 6: Empirical Relationship between Interests and Whether States Fight

Though it cannot be ruled out that the two models are independent, it is still possible that the results of separate stages are affected in other ways. The first set of coefficients and standard errors, labeled the “Basic Model,” combine Equation 1 “Distance to Initiator,” with Equation 2 “MID Initiation.” Results for the “where” portion (Equation 1) are substantively unchanged from Table 1. As mentioned above, coefficients and standard errors on key variables are each roughly doubled. National capabilities strongly influence the location of contests, while national interests and contiguity have no significant effect on where states fight. In Equation 2, however, the insignificance of capabilities on the decision to fight is now even more striking. Because the two-stage model requires equivalent variables to compete directly to affect either location or initiation/onset, or both, the CINC interaction term is now statistically insignificant throughout Equation 2.

Interest affinity, on the other hand, performs much as it has in the previous two tables. States with similar interests are considerably less likely to experience a MID, but interest affinity has no significant effect on where states fight. Contiguity follows the same pattern as the interest variable, suggesting that it is measuring the (unique) contribution of proximity for willingness, rather than opportunity. Other variables perform largely as anticipated by the discussion of Tables 1 and 2.

The second model in Table 3, again labeled the “Basic Model” flips dependent variables, using location-to-target distance in the “where” stage and onset rather than initiation in the “whether” stage. Other than the anticipated sign changes in capabilities variables in the location stage, not much changes in these results. The third “Interaction” model adds  $CINCA \times CINCB$  and  $Size_A \times Size_B$  to equation 1 and the regime type and development variables to equation 2. Capabilities continue to matter for location but not for onset, while *Affinity* affects onset but not location.

Finally, the “kitchen sink” regression adds the full complement of independent variables, returning to using location-to-initiator as the dependent variable in equation 1 and MID initiation in equation 2. Once again, the monadic capabilities variables swap signs in conformity with the directionality of the location dependent variable. Other variables perform largely as expected.

## 7 Conclusion

This study has sought to disentangle the relationship between contiguity, capabilities and national interests. It has long been assumed that capabilities are an important (perhaps the most important) determinant of the decision to fight. Results here suggest that capabilities generally have a much less important, often insignificant effect on the onset or initiation of militarized violence. At least in part this is because of the impact of capabilities in determining where states fight, which absorbs a substantial portion of variation in the ability to compete. Realization that power projection is driven by the very forces typically attributed to decisions about whether to fight helps to explain why capabilities are relatively unimportant for conflict onset or initiation. Rather than absenting themselves completely from competition, weak states claim more modest objectives. Conversely, the capable are not much more (or less) likely to fight precisely because increased power is mostly applied to expanding the domain over which capable countries seek to exercise influence.

State interests have most generally been to complement, or even derive from national capabilities. This view is harder to maintain in light of the theory and evidence provided here. Rather than serving as an adjunct to world affairs, what states want, and where their interests clash, create important incentives for nations to compete, sometimes through violence. Bearing in mind the limitations of conceptualization and measurement of the indicator used here, interests matter



much more for whether nations fight, but they in turn do not make much difference in terms of the location of contests. The insignificance of interests for the location of contests may not stand should contextual measures of geographic interests eventually be coded and integrated into similar analyses. On the other hand, it may well be that the value of influence is nearly ubiquitous, so that nations with incompatible interests seen to project their preferences over large swaths of intervening territory. Certainly, this was the experience of nations in the Cold War, for example.

The study also casts some additional light on contiguity. Neighbors interact in ways that make them more prone to fight, independent of capabilities, interests, or other determinants of conflict. Patterns of location and dispute initiation or onset for contiguity and interests run in parallel, while those between contiguity and capabilities do not. Contiguity appears to capture some aspects of willingness that are unique to neighbors, while opportunity aspects of contiguity are contained by metric distance. This may be related to a richer geographic context for interests, something that future research will explore. Alternately, neighboring nations may develop additional animosities due to psychological or strategic factors that are not neatly contained in available measures of distance, interests or capabilities available. This, too, will require additional research.

This study has found that capabilities and interests largely perform different functions in the conflict process. In contrast to conventional wisdom, the two cannot necessarily be treated as substitutes, or even complements. Capable countries get to dominate greater portions of territory — even greater than the physical boundaries of the nation itself — and to project power over larger distances. This is valuable if influence is cumulative, as it appears to be. Yet, most countries can influence something, somewhere, even if it is only to resist the distant influence of more capable powers. It is interests, however, which propels nations to war and lesser disputes. Nations with similar interests have no reason to compete, making capabilities less relevant. A better understanding of the complementary determinants of where and whether states fight will perhaps aid in the objectives of understanding international conflict and promoting interstate peace.

## A Equilibria and Optimal Strategies for the Game

The appendix provides players' optimal strategies and equilibria for the game discussed in the text.

### A.1 Players' Optimal Strategies:

$$\begin{aligned}
 i: \quad \mathbf{f} &= 1 \quad \text{if } c_i < c'_i, \\
 &= 0 \quad \text{if else.} \\
 \mathbf{z}^* &= \text{Eq. 8} \quad \text{if } 0 \leq \text{Eq. 8} \leq y_{max}, \\
 &= y_{max} \quad \text{if } \text{Eq. 8} > y_{max}, \\
 &= 0 \quad \text{if else.} \\
 \mathbf{d}^* &= \arg \max_d \pi_i \quad \text{if } 0 \leq \arg \max_d \pi_i \leq x, \\
 &= x \quad \text{if } \arg \max_d \pi_i > x, \\
 &= 0 \quad \text{if else.} \\
 j: \quad \mathbf{r} &= 1 \quad \text{if } c_j < c'_j, \\
 &= 0 \quad \text{if else.}
 \end{aligned}$$

### A.2 Equilibria:

$$\begin{aligned}
 [\mathbf{r}=\mathbf{0}] &\text{ if } c_j \geq c'_j \\
 [\mathbf{r}=\mathbf{1}, \mathbf{f}=\mathbf{0}] &\text{ if } c_j < c'_j \quad \text{and} \quad c_i \geq c'_i \\
 [\mathbf{r}=\mathbf{1}, \mathbf{f}=\mathbf{1}] &\text{ if } c_j < c'_j \quad \text{and} \quad c_i < c'_i
 \end{aligned}$$

### A.3 Beliefs:

Beliefs must be sequentially rational, but given the lack of signaling or other updating of information, beliefs are simply consistent with the distribution of types  $(U[c_{i_{min}}, c_{i_{max}}], U[c_{j_{min}}, c_{j_{max}}])$ .

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