

# An Institutional Explanation of the Democratic Peace<sup>a</sup>

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## ABSTRACT

We examine formally the link between domestic political institutions and policy choices in the context of eight empirical regularities that constitute the democratic peace. We demonstrate that democratic leaders, when faced with war, are more inclined to shift extra resources into the war effort than are autocrats. This follows because the survival of political leaders with larger winning coalitions hinges on successful policy. The extra effort made by democrats provides a military advantage over autocrats. This makes democrats unattractive targets since their institutional constraints cause them to mobilize resources toward the war effort. In addition to trying harder, democrats are also more selective in their choice of targets. Since defeat is more likely to lead to domestic replacement for democrats than for autocrats, democrats only initiate wars they expect to win. These two factors lead to the interactions between polities that is often referred to as the democratic peace.

The study of international relations has produced relatively few widely accepted generalizations. One such generalization, sometimes even asserted to be an empirical law of international relations (Levy 1988), is that democracies do not fight wars with one another. The empirical evidence for this claim is, in fact, quite strong (Maoz and Abdolali 1989; Bremer 1992; Oneal and Russett 1997; Ray 1995). Recent efforts to cast this empirical observation in doubt notwithstanding (Layne 1994; Spiro 1994; Farber and Gowa 1995; Schwartz and Skinner 1997), extensive, rigorous statistical tests all show a significant propensity for democracies to have been virtually immune from wars with one another (Russett 1995; Maoz 1998). Associated with this observation of what has come to be termed the "democratic peace" are seven additional empirical regularities that relate war-proneness and democracy. These are the data-based observations that democracies are not at all immune from fighting wars with non-democracies (Maoz and Abdolali 1989);<sup>1</sup>democracies tend to win a disproportionate share of the wars they fight (Lake 1992; Reiter and Stam 1998a); when disputes do emerge, democratic dyads choose more peaceful processes of dispute settlement than do other pairings of states (Brecher and Wilkenfeld 1998; Dixon 1994; Mousseau 1998; Raymond 1994); democracies are more likely to initiate wars against autocracies than are autocracies against democracies (Bennett and Stam 1998); in wars they initiate, democracies pay fewer costs in terms of human life and fight shorter wars than nondemocratic states (Bennett and Stam 1996; Siverson 1995); transitional democracies appear more likely to fight than stable regimes (Mansfeld and Snyder 1995; Ward and Gleditsch 1998); and larger democracies seem more constrained to avoid war than are smaller democracies (Morgan and Campbell 1991).

Although these observations about democracy and war are part of an important pattern, they lack a coherent explanation. Several possible explanations have been put forward, but none has gained broad acceptance. Here we propose a game theoretic model that may help bring closure to the debate on the causal mechanism governing

the eight regularities mentioned above. The model we propose is one element in a more general explanation of a number of other phenomena in international relations and in comparative politics, and here we focus only on it as an explanation of the phenomena associated with democratic war behavior. It will be shown to account for the empirical record regarding:

- (1) the tendency for democracies not to fight with one another;
- (2) the tendency for democracies to fight with non-democracies with considerable regularity;
- (3) the tendency for democracies to emerge victorious from their wars;
- (4) in the event of war, the tendency for democracies to initiate against autocracies rather than for autocracies to initiate against democracies;
- (5) when disputes do occur between democracies, the tendency for them to use conflict management processes that reach peaceful settlements;
- (6) the tendency for democracies to experience fewer battle deaths and fight shorter wars when they initiate conflict;

The regularities concerning transitional democracies (Mansfeld and Snyder 1995; Ward and Gleditsch 1998) and concerning the constraints on great power democracies (Morgan and Campbell 1991) are stated in monadic form. These regularities cannot be evaluated in terms of a model of strategic interaction without additional information. Specifically, without data on the adversary, we cannot evaluate the relevant institutional and resource relationships. Later we provide an interpretation of our model that is consistent with both monadic results, but we cannot undertake a more rigorous assessment.

## THE DEBATE

The current debate over the war behavior of democratic states, and particularly the democratic peace, centers on whether a normative or an institutional explanation

best accounts for the known facts. Normative accounts focus on several different presumptions about democracies. One such supposition is that they share a common value system, including respect for individual liberties and competition. As stated by Dixon (1994):

. . . international disputes of democratic states are in the hands of individuals who have experienced the politics of competing values and interests and who have consistently responded within the normative guidelines of bounded competition. In situations where both parties to a dispute are democracies, not only do both sides subscribe to these norms, but the leaders of both are also fully cognizant that bounded competition is the norm, both for themselves and their opponents.

A closely related argument is that citizens in democracies abhor violence and so constrain their leaders from pursuing violent foreign policies. As succinctly explained by Morgan and Campbell (1991), "the key feature of democracy is government by the people and . . . the people, who must bear the costs of war, are usually unwilling to fight." However, adherents of these perspectives also argue that democracies are willing to set aside their abhorrence of violence or their respect for other points of view when they come up against authoritarian states because the latter do not share these common values. As stated by Maoz and Russett (Maoz and Russett 1993), "when a democratic state confronts a nondemocratic one, it may be forced to adapt to the norms of international conflict of the latter lest it be exploited or eliminated by the nondemocratic state that takes advantage of the inherent moderation of democracies."

We believe that any explanation of the democratic peace must satisfy two criteria. First, it must account for all the known regularities that are often grouped together to define the democratic peace. An explanation that accounts for all of the regularities obviously is more comprehensive than those that account for only some. Further,

because the extant explanations are generally constructed in response to the observed regularities, the ability to explain all the known patterns helps build confidence that the account is not simply an ex post rationalization of a few patterns of behavior. Clearly, the more patterns that are explained, the more credible the explanation, provided that it does not come at the expense of parsimony. Second, we believe that a credible explanation should also suggest novel hypotheses that do not form part of the corpus of the democratic peace. If these novel hypotheses are borne out by evidence that adds further credibility to the overall explanation. The existing norms-based and institutional-constraints arguments fail both of these tests. The model we propose provides an explanation of all the known regularities discussed earlier, and suggests numerous novel hypotheses that are supported by evidence. Later, for instance, we show that our theory implies that democracies devote more resources to their war efforts than do non-democracies and we cite independently derived evidence that this is true. Additionally, we have shown elsewhere that the institutional model we propose also accounts for variation in economic growth across regimes and explains why leaders with failed public policies tend to last in office longer than leaders with successful policies (Bueno de Mesquita et al 1999).

The norms argument has gained considerable support. There are, however, empirical difficulties for the norms argument. The historical record is replete with democratic states that followed policies sharply at variance with it. Some categories of war fought by democracies are inconsistent with norms of cooperation. For example, democratic states pursued imperialism. In building empires democracies engaged in numerous wars that were about subjugation rather than self-protection. Later they sought to retain their empires in the same manner. Even if democratic states resort to realist strategies in the face of powerful nondemocratic opponents who threaten their existence, too many democratic wars have been waged against significantly weaker states for this argument to be sustained. In fact, some conflicts are against states so

weak they are virtually unable to resist. Such contests are too lopsided to qualify as wars in the most widely used data set. Consider, for example, the United States invasions of the Dominican Republic, Panama or Grenada. Other actions that do not qualify as wars are also inconsistent with the norms argument. The analyses of covert operations by James and Mitchell (1995) and Forsythe (1992) demonstrate that democratic leaders often have undertaken violent acts against other democracies when the costs of such actions are low. It is difficult to reconcile such patterns of behavior with democratic political culture. The model we propose accounts for this pattern.

The institutional constraints argument holds that democracies are more deliberate in their decision making because their procedures preclude unilateral action by leaders. This is thought to raise the costs of violence. As put by Maoz and Russett (1993), "due to the complexity of the democratic process and the requirement of securing a broad base of support for risky policies, democratic leaders are reluctant to wage wars, except in cases wherein war seems a necessity or when the war aims are seen as justifying the mobilization costs."<sup>2</sup> This latter argument seems, however, to suggest that democracies should be unlikely to wage war generally and not just against other democracies.

The empirical record does not support such a conclusion.<sup>3</sup> Rather, it shows that democracies do not fight one another, but do indeed engage in wars with authoritarian regimes.<sup>4</sup> The argument based on the cheapness of expressing opposition seems stronger than the other putative institutional explanations, but it too has shortcomings, one of which is that it fails to account for the well-known rally-round-the-flag effect observed in democracies at the outset of crises and wars (Mueller 1973; Norpoth 1987). This effect suggests that there is not an inherent abhorrence of violence in democracies. Most importantly from a theoretical position, none of the institutional constraints arguments have a sufficiently well developed theory of how and

why democratic institutions constrain leaders in the particular way that produces the regularities that have been observed while other institutional arrangements do not. Rather, these arguments generally just assert that democratic leaders are more constrained.

Bueno de Mesquita and Lalman's signaling explanation accounts for three of the eight observed regularities (Bueno de Mesquita and Lalman 1992). They did not, for instance, explain why democracies win a disproportionate share of their wars or why their costs are lower. Bueno de Mesquita and Siverson's model accounts for these regularities, but not for the democratic peace (Bueno de Mesquita and Siverson 1995). Both Bueno de Mesquita and Lalman's signaling explanation and Bueno de Mesquita and Siverson's model have in common the assumption that democracies are more constrained than autocracies. For reasons of theoretical parsimony, however, we prefer that this be a deductive result of a general model, rather than an assumption. That is, we wish to account for the several empirical regularities without assuming that one type of political system is more constrained than another. Instead, we will demonstrate how institutional arrangements produce different levels of constraint in different political systems and what effect those institutional arrangements have on behavioral incentives and the empirical generalizations of interest.

The explanation we offer below shows that the behavioral incentives (perhaps these could be called norms) are themselves endogenous to certain political institutions and the interests that sustain them.<sup>5</sup> We make no assumptions about the citizens' abhorrence of violence or even the ease with which they might protest governmental policies. In fact, we assume that political leaders in democracies, autocracies, military juntas, monarchies and any other form of government all are motivated by the same universal interest: they desire to remain in office. We make no normative assumptions about differences in the values or goals of democratic leaders or their followers as compared to authoritarian leaders or their followers. We do, however, propose a

model that offers an explanation of the known regularities regarding the democratic peace.

## POLITICAL INSTITUTIONS

All polities are characterized by institutional rules. These rules pertain to the role citizens have in influencing the selection of government leaders. Let any polity consist of  $N$  citizens. Let  $S$  be the subset of  $N$  that participates in the selection of the political leadership. We call this subset the selectorate. Then  $N-S$  is the set of disenfranchised citizens with no say in the choice of leadership. All members of  $S$  have the right to participate in choosing the government. A subset of the selectorate forms a winning coalition, which we denote as  $W$ . Members of the winning coalition are those people whose support is required to keep the incumbent in office. If the incumbent leader cannot find  $W$  members of the selectorate to support her then she is removed from office.<sup>6</sup> Since we assume that leaders are keen to stay in power, they are eager to satisfy members of the winning coalition. Later we will see that satisfaction is attained by the allocation of public and private goods, with that allocation being dependent on the specific institutional configuration of the polity.

Typical categories of regimes can be easily related to the institutional variables on which we focus. In a democracy with universal suffrage, for instance,  $S$  is approximately equal to  $N$  and  $W$  is large, typically being a majority of  $S$ . In monarchies and military juntas,  $W$  and  $S$  are typically small relative to  $N$ . In some authoritarian states,  $S$  is quite large and in others it is very small, while  $W$  is always small in such systems. In a communist state, for instance,  $S$  has typically included something between just the members of the Communist party (i.e., 57 million people in China), and all citizens since universal suffrage (in largely meaningless elections) is commonplace for such systems. Authoritarian systems are often characterized by rigged elections in which  $S$  is large, but has little impact on actual governance other

than to raise the risks for members of the winning coalition if they defect from the incumbent, as we explain below.

Later we construct numeric examples to illustrate the comparative static results from the model we develop. We consider, for instance, an example in which a democracy is defined as a state with a selectorate of 1000 and a winning coalition of 501. The stylized autocracy with which we illustrate results has a selectorate of 100 and a winning coalition of 10.

Incumbent leaders (as individuals or as a governing coalition) select and implement public policies. These public policies inevitably have public goods components and private goods components. Leaders have only a scarce amount of resources to allocate to different policy goals and to help keep them in place. They can put everything into public policy that benefits everyone in the polity, everything into private goods that are consumed only by members of the winning coalition, or any mix in between. Naturally, if they spend resources on, for instance, providing defense for the citizenry, they cannot use those same resources to provide special privileges to the members of the winning coalition. If they buy national defense only from cronies in the winning coalition, then the reduced competition to provide defense will likely result in an inefficient provision of that public good while cronies skim money off the top for their personal gain. Thus, scarcity necessarily requires leaders to make choices over just how much to focus their limited time and other resources on providing generally beneficial public policies and how much to focus on just satisfying the wants of their core supporters. The central concerns here are to identify how scarce resources are allocated during an international dispute, given variations in institutional arrangements; to identify whatever dependencies exist between regime type and war participation and outcomes; and to evaluate the prospects that leaders are retained in place as a function of their institutional arrangements. These issues, as we will show, influence whether leaders concentrate resources on pursuing national goals or conserve their

resources to benefit key domestic constituents. In showing that this is true, we will account for the empirical regularities that constitute the so-called democratic peace.

Before turning to the formal representation, we pause to describe the basic structure of our model and outline the intuition that leads to the democratic peace result. We start by assuming that two nations, A and B, are engaged in a dispute. The leaders in each nation must decide whether they are prepared to start a war in the hope of achieving their objectives or rely instead on a negotiated settlement. If either side initiates a war, then both leaders must decide how much of an effort they are prepared to make to achieve military victory in the war. By this we mean, what proportion of available resources is a leader prepared to allocate to the war effort rather than to other purposes. Obviously, leaders who dedicate large quantities of resources to the war are more likely to win, but at the cost of not having those resources available to reward their supporters. The citizens receive payoffs based on the outcome of the crisis { be it a war or a negotiated settlement } and the rewards that accrue from resources that are not consumed in the war effort. Given these payoffs, the winning coalition decide whether to retain their current leader or whether they would be better off replacing her.

A polity's institutional arrangements shape the selection criteria that supporters use to determine whether to retain the incumbent. Hence political institutions determine which outcomes allow a leader to keep her job and which do not. As we shall see, these differences profoundly influence the policies that leaders choose.

Citizens in general enjoy the benefits of public policies whether they belong to the winning coalition or not. The advantage that members of the winning coalition have is that they also enjoy a share of whatever private goods are allocated by the leadership. On average, each member of the winning coalition receives a share of private goods equal to  $\frac{R}{W}$ , where R is the available pool of resources and W is the size of the winning coalition.

As the winning coalition gets larger, holding the budget constant, each member's share of private goods decreases. This makes public policy benefits loom larger in the overall utility assessment of members of the winning coalition in more democratic polities as compared to autocracies. One consequence is that democratic leaders, being just as eager to retain office as their authoritarian counterparts, must be especially concerned about policy failure. To reduce the risk of policy failure and subsequent deposition, they make a larger effort to succeed in disputes. This means that they are willing to spend more resources on the war effort and only engage in fights they anticipate winning. In contrast, leaders with small winning coalitions reserve more resources for distribution to their supporters in the form of private goods. As long as they can provide substantial private goods, they are not at such a high risk of being deposed as are their democratic counterparts who, perforce, cannot give large amount of such benefits to each member of their winning coalition.

Democratic leaders are more likely to try hard to win their wars than are autocrats. If they do not expect to win, they try to avoid fighting. This implies that they pick and choose their fights more carefully. This has several consequences. Democrats are more likely to win wars than autocrats for two reasons. First, if they need to, democrats try hard, spending resources on the war to advance their public policy goals (Reiter and Stam 1998a). Second, fearing public policy failure, democrats try to avoid those contests they do not think they can win. Since two democrats in a dispute both try hard, both can anticipate that, if they go to war, each will spend lots of resources in a risky situation where they are not disproportionately advantaged by their great effort. This is shown to incline democrats generally to negotiate with one another rather than fight (Lake 1992; Stam 1996 p.176-178). By contrast, autocrats typically reserve their resources for domestic uses as their political survival depends on satisfying a few key constituents through the distribution of private goods. Autocrats do not have a great need to produce successful public

policies. Consequently, autocrats try less hard than democrats in war, but still sometimes fight in wars where their chances are poor because defeat does not so greatly affect their prospects of political survival at home. Democrats, by their superior level of effort, more often defeat autocratic foes and achieve successful policy outcomes. This helps enhance their reselection.

## THE GAME

The game starts by assuming that there are two nations, A and B, engaged in a dispute. The leaders in A and B each decide whether to escalate the dispute by using force. This decision is made under uncertainty about what choice the rival state's leader will make. We define the state of war to be any situation in which at least one of the two states chooses to fight rather than negotiate. If neither state decides to use force, then the dispute is resolved through negotiation. Although largely incidental, as a modeling choice we assume that if a nation starts a war, then it does not know whether the other side's use of force is retaliatory or whether it too chose to fight rather than negotiate. Once a war starts both nations decide how much effort to make, uncertain about the effort level chosen by the rival. The war's outcome is a function of the relative effort by each side. That is, who wins depends in part on how leaders choose to allocate their scarce resources. When the dispute is settled, either through negotiation or war, the domestic audiences in A and B then decide whether to retain their leader or depose the incumbent (Fearon 1994; Smith 1998). To make this decision, they evaluate their payoffs under each contingency and decide whether they are better off remaining in the incumbent's winning coalition or defecting to a prospective new leader.

## Settling Crises by War

We model war as a costly lottery in which each player's expected utility from the war depends on the probability that its side wins or loses and the utilities associated with each possible outcome. In this section we develop our notions regarding the probability of victory (and defeat) and the attendant utilities.

The utility of victory is set equal to 1 and of defeat it is 0. Additionally, the utilities include the per capita cost of fighting, which we denote as  $k$ . Then, the utility of victory equals  $1 - k$  and the utility for defeat is  $-k$ .

Many factors give shape to the outcome of a war. Observable military capabilities certainly play an important part. So too do intangible capabilities (Buono de Mesquita, Morrow and Zorick 1997; Clausewitz 1968; Stam 1996). Short-term shifts in government priorities by putting more national resources behind a war effort also have an impact on the likelihood of success (Organski and Kugler 1980; Kim and Morrow 1992; Powell 1996a). The probability of victory is presumed to be increasing as the total military advantage dedicated to the war effort of one side grows relative to the other side. Therefore, if a war occurs the victor is more likely to be the nation with the most total military capabilities dedicated to the war effort. We consider three types of military capabilities: the observable military balance,  $M$ , intangible military assets,  $m_i$ , and the proportion of additional national resources committed to the war effort,  $g_i$ . The subscript refers to nation A or B, as appropriate. The military balance, which takes values between 0 and 1, represents the ratio of observable military assets of the two sides.  $M$ , therefore, is treated as common knowledge. The unobservable (and possibly intangible) assets include such factors as morale, quality of leadership, secret weapons capabilities, and the like.<sup>7</sup> While these unobservable assets are the private knowledge of the relevant leader, others have beliefs about their value. For simplicity, we assume that beliefs about intangible assets are uniformly dis-

tributed on the unit interval:  $m_A \gg U[0; 1]$ , and  $m_B \gg U[0; 1]$ . Additional resources dedicated to the war effort by either country are revealed upon the inception of hostilities. Each leader has  $R_i$  resources at her disposal. By choosing to devote the proportion  $g_i$  of  $R_i$  to the war effort, she generates an additional  $g_i r$  military assets, where  $r$  represents the exchange rate between resources and military capability.

The probability that A wins in a war, denoted  $q_A(m_A; m_B; g_A; g_B)$ ; is increasing in  $M$ ,  $m_A$ , and  $g_A$  and is decreasing in  $m_B$  and  $g_B$ . In general, we model  $q_A$  as the probability that a random variable  $\epsilon$  with distribution  $\Phi(\cdot)$  is less than a function of the variables  $f(m_A; m_B; M; g_A; g_B)$ : The probit model, in which  $\Phi(\cdot)$  is a standard normal distribution, and  $f(m_A; m_B; M; g_A; g_B) = M + m_A \beta_1 + m_B \beta_2 + g_A \beta_3 + g_B \beta_4$ , represents a common view of the probability function linking capabilities to the outcome of war.<sup>8</sup>

## Negotiations

If the dispute progresses to negotiations, rather than a war, then what is a reasonable focal point expectation about the outcome? We assume that the negotiated settlement reflects the observable military balance, which, of course, depends on the relative wealth of the two states. At first blush, one might expect negotiations to reflect the total assets of the rival sides, including their intangibles and the effort level each was prepared to make in the event of war. However, effort level and intangibles are not revealed in the absence of fighting. Consequently, each state has the incentive to claim that their intangibles and their war-effort preparedness are very high. Since the other side always knows that the rival has no incentive to truthfully reveal weakness, the claimed additional assets are cheap talk. The claims lack credibility. It is because these claims cannot be credibly communicated that nations must engage in costly fighting to reveal this information.<sup>9</sup> Therefore, during negotiation, all that can credibly be communicated are observable capabilities.

The payoff to nation A from a negotiated settlement is  $M$  which is enjoyed by

all citizens in A. That is, this payoff is a public good. The citizens in B enjoy the benefit  $1 - M$  from negotiation, reflecting the fact that  $M$  is increasing as the military advantage shifts toward A:

$$U_A(\text{negotiations}) = M$$

$$U_B(\text{negotiations}) = 1 - M$$

Table 1, below, summarizes the policy payoffs associated with each possible outcome of the international dispute. We let  $z$  represent the generic outcome. Everybody in nation A receives the policy payoff  $V_A(z)$  associated with the outcome  $z$  and all members of polity B receive the payoff  $V_B(z)$ .

Table 1: The Policy Payoffs Associated with International Outcomes

$z$	Outcome	$V_A(z)$	$V_B(z)$
nego	negotiations	$M$	$1 - M$
$vic_A$	A wins the war	$1 - k$	$-k$
$def_A$	A loses the war	$-k$	$1 - k$

### Reselection

Following the international dispute, the leaders in each nation face reselection. The members of the selectorate evaluate the payoff they received under the incumbent leader. They compare this payoff with what they expect to receive if they depose the incumbent and choose a domestic challenger instead. Deposing the incumbent is not simply a matter of concluding that she has done a poor job during the dispute. Rather, it is a question of whether the members of  $W$  believe they would have been better off under alternative leadership.

Incumbents are deposed when they can no longer convince  $W$  members of the selectorate to support them. Providing the package of benefits that incumbents offer their supporters is better than the rewards that challengers can potentially offer, incumbents can find  $W$  members of the selectorate willing to accept these rewards

in exchange for their support. Yet, if incumbents fail to provide benefits in excess of what supporters can credibly expect to receive from a challenger, then incumbents can no longer garner enough support to form a winning coalition. At this point, their supporters defect and the incumbents are ousted. Yet, the decision to defect is not simply a choice about which leader is better. Defection is risky. There is neither a shortage of would-be challengers, nor a shortage of prospective defectors. Consequently, a member of the current winning coalition cannot be certain of being essential to the successor government. By defecting, the member of the winning coalition places her or his private goods benefits at risk. We characterize that risk as increasing as the pool of available members for a winning coalition increases and as decreasing as the necessary size of the winning coalition increases. That is, the risk increases as  $S$  increases and decreases as  $W$  increases. For simplicity sake, we treat the probability of being a member of the successor winning coalition in nation  $A$  as  $\frac{W_A}{S_A}$ . Then, the expected utility from private goods if one defects to a challenger is simply  $\frac{R_A}{W_A} \frac{W_A}{S_A} = \frac{R_A}{S_A}$ :

Like the incumbent, the challenger proposes a mix of public and private goods allocations. Of course, the selectorate does not know what the challenger can actually deliver. In contrast, they have observed the performance of the incumbent. So, the selectorate must infer the ability of the challenger. That, of course, is the inherent feature of any political campaign, whether the society is democratic or autocratic. We denote the strength or ability of the challenger in nation  $A$  as  $c_A$  and use comparable notation for  $B$ 's challenger in his nation.

Though the selectorate is uncertain of the ability of the challenger its members learn something about the challenger's ability through the process of mounting a campaign.<sup>10</sup> If the challenger performs well during the campaign, appearing competent, then we expect that he will perform well once in office (Riker 1996). At the time the incumbent leader makes her choices about fighting or negotiating and how

to allocate resources, she is uncertain of the qualities of a prospective domestic rival. We represent the distribution of possible challengers whom the incumbent may face using the cumulative density function  $F(x)$ , where  $F(x) = \Pr(c_A \leq x)$ :

What can a challenger credibly offer the selectorate? The challenger cannot make credible promises regarding how he will perform during a dispute or on other policy questions. Knowing this, the selectorate focuses on the reservation value they expect if they choose a new leader. We assume that the reservation value for picking the challenger is:  $c_A + \frac{R_A}{S_A}$ :

Incumbents can anticipate what they need to provide to defeat challengers. They simply must provide more utility for their coalition members than that offered by the challenger. Incumbents provide:

$$(1 - g_A) \frac{R_A}{W_A} + \lambda + V_A(z)$$

where  $\lambda$  represents the performance of the leader on all other policy dimensions. This term is quite intuitive.  $V_A(z)$  is the utility supporters derive from the outcome of the policy of the leader in the international dispute.<sup>11</sup>  $(1 - g_A)$  is the proportion of private goods resources reserved for distribution to the winning coalition after spending  $g_A$  on the war effort (which is zero if there was no war). The total pool ( $R_A$ ) is diminished by whatever portion has gone to the war effort, if any. What remains is distributed evenly to the members of the winning coalition so that each member receives  $(1 - g_A) \frac{R_A}{W_A}$ : Of note is that members of the winning coalition receive their share of private goods for sure if they stick with the incumbent, while only receiving such goods probabilistically if they defect. Additionally, neither the incumbent nor the challenger can promise to distribute any resources that are destroyed or lost by the state during a war. This proves important later in understanding why autocrats do not make the same allocation decision as do democratic leaders.

Probability of reselection Providing that a winning coalition continues to support the incumbent then she survives in office. Let  $\gamma_A(z) = \gamma_A(z; g_A; 1)$  represent the probability that leader A remains in office given the outcome  $z$ .  $\gamma_A(z) = \Pr((1 - g_A) \frac{R_A}{W_A} + V_A(z) + 1 > c_A + \frac{R_A}{S_A}) = \Pr((1 - g_A) \frac{R_A}{W_A} > \frac{R_A}{S_A} + V_A(z) + 1 - c_A) = F(V_A(z) + R_A \frac{(1 - g_A)}{W_A} > \frac{1}{S_A} + 1)$

That is, the leader is retained in office provided that the package of private and public goods she provides to the winning coalition is superior to that which a member of the winning coalition can expect from a challenger.

The incumbent has a selection advantage over the challenger. The challenger has to offer the members of the winning coalition more than they expect to get under the current leadership. Unfortunately, the challenger can not credibly guarantee that members of the existing coalition will also be members of the next coalition. The incumbent is advantaged in her ability to supply private goods because current members of the coalition are sure of receiving them. However, the size of the leader's incumbency advantage depends upon the configuration of the polity's political institutions. Given her advantage in private goods, the incumbent survives providing she does not do such a poor job on public policy that she is judged grossly incompetent as compared to the challenger. That is, as long as  $c_A$  is not especially large or strongly negative, the incumbent has the upper hand. What constitutes sufficient policy incompetence by the leader so that she gets deposed, however, depends on the structure of the polity. If the leader has a huge advantage over the challenger in her ability to supply private goods then she can survive disastrous policy outcomes. Although leaders from systems with large winning coalitions, for example democracies, have some advantage in the supply of private goods, the magnitude of this advantage is small and as such these leaders can not tolerate policy failure.<sup>12</sup>

The preceding discussion makes clear what the incentives of leaders are. We now specify those formally, by denoting the payoffs to leaders under each contingency they

face. In particular, if the outcome of the international dispute is  $z$  and the leader's effort level was  $g_A$ , and assuming the leader also gets the payoffs of any member of the winning coalition, then the leader's payoff is:

$$U_A(z; g_A) = V_A(z) + \alpha \frac{1}{4}_A(z; g_A) + (1 - g_A) \frac{R_A}{W_A}$$

where  $\alpha$  is the leader's utility for remaining in office and the other terms refer to the payoff from membership in the winning coalition.<sup>13</sup>  $\frac{1}{4}_A$ , recall, is the probability that A retains power.

During a dispute, leaders decide whether to initiate fighting or to negotiate. If either leader decides to fight, then each leader must choose a level of effort. Following the end of the dispute, members of the winning coalition decide whether to remain loyal or to defect, thereby retaining or bringing down the incumbent leadership.

The decisions leaders make depend on their own nation's level of military assets, including intangibles ( $m_A$ ). Of course, the intangibles of the rival state also are important in the decision to fight since they influence the outcome of any violent conflict. Leaders know their own type; that is, what level of intangible assets they possess, but they do not know the rival's type. Instead, they hold a belief about the adversary's type and learn more about it as the dispute unfolds. Let  $\mu_B(m_B|h)$  represent A's beliefs about the probability density of B's type, given that A has observed the history of play  $h$ .

A strategy for each leader is a decision to fight or not to fight. Let  $\frac{3}{4}_A(m_A)$  be the probability that type  $m_A$  fights. If a war occurs, then each nation must pick an effort level which represents the proportion of their resources devoted to the war. Thus, let  $g_A(m_A)$  be the effort that A exerts if a war occurs, given the history of play ( $h$ ) that took A into war. For instance, one possible history is that A initiated violence and B responded, though other histories, of course, are also possible.

## SOLVING THE GAME

We solve the game by finding the perfect Bayesian equilibria. We begin by analyzing the effort decision conditional on a war having been started. In general if B plays the strategy  $g_B(m_B)$  and A's beliefs about B's type given the history of play are  $\mu_B(m_B|war)$  then A's probability of victory depends upon her effort level and her type:  $p_A(m_A; g_A) = \int_0^1 q_A(m_A; m_B; g_A; g_B(m_B)) \mu_B(m_B|war) dm_B$ . A's payoff given this effort level is  $p_A i k + a (p_A \frac{1}{4}_A (vic_A; g_A) + (1 - p_A) \frac{1}{4}_A (def_A; g_A)) + (1 - g_A) \frac{R_A}{W_A}$ . Thus, A's optimal effort level is  $g_A(m_A) = 2 \arg \max_{g_A \in [0;1]} p_A(1 + a (\frac{1}{4}_A (vic_A; g_A) - \frac{1}{4}_A (def_A; g_A))) i k + a \frac{1}{4}_A (def_A; g_A) + (1 - g_A) \frac{R_A}{W_A}$ .

In words, leader A spends her resources on the war effort when the positive impact of doing so on the marginal probability of victory is large and the negative impact on the probability of reselection is low. To sharpen the distinction between systems, we concentrate on the decision to make an all out effort or no extra effort during the war.<sup>14</sup>

When A spends all her resources on the war effort, her probability of victory is  $p_A = p_A(m_A; g_A = 1) = \int_0^1 q_A(m_A; m_B; g_A = 1; g_B(m_B)) \mu_B(m_B|war) dm_B$ , giving her an expected payoff of  $p_A i k + a (p_A \frac{1}{4}_A (vic_A; 1) + (1 - p_A) \frac{1}{4}_A (def_A; 1))$ . Alternatively, if she reserves her resources to reward her supporters, then her probability falls to  $p_A^0 = p_A^0(m_A; g_A = 0) = \int_0^1 q_A(m_A; m_B; g_A = 0; g_B(m_B)) \mu_B(m_B|war) dm_B$ , giving her an expected payoff of  $p_A^0 i k + a (p_A^0 \frac{1}{4}_A (vic_A; 0) + (1 - p_A^0) \frac{1}{4}_A (def_A; 0)) + \frac{R_A}{W_A}$ . Thus, A spends her resources on the war effort if  $p_A(1 + a (\frac{1}{4}_A (vic_A; 1) - \frac{1}{4}_A (def_A; 1))) i p_A^0(1 + a (\frac{1}{4}_A (vic_A; 0) - \frac{1}{4}_A (def_A; 0))) > \frac{R_A}{W_A} + a (\frac{1}{4}_A (def_A; 0) - \frac{1}{4}_A (def_A; 1))$ .<sup>15</sup>

Given these effort decisions, leaders can anticipate their nation's probability of victory should they decide to fight. Whether A attacks depends upon her expectation about B's effort decision. If A attacks then her payoff is the  $\max(U_A(fight|m_A; g_A =$

1);  $U_A(\text{fight}; m_A; g_A = 0)$ ; that is the larger of her utility in a fight given that she makes an all out effort or given she makes no extra effort. The decision to fight, then, depends upon the comparison of A's utility from fighting and A's utility from negotiating:  $U_A(\text{nego}) = M + \alpha \frac{1}{W_A} + \frac{R_A}{W_A}$ .

Now we can examine how the decision to fight or to pursue negotiations is influenced by institutional arrangements. The key, as we will see, rests on the willingness of leaders to try hard if there is a war. This in turn, depends on how resource allocation decisions affect reselection prospects.

The key difference between systems is the relative impact of private goods on the probability of survival. Autocratic leaders, having much smaller winning coalitions, can give each of their supporters a larger share of the resources than is true of democratic leaders. If all types of leaders decide not to try hard, reserving resources to give to their supporters (i.e.  $g_A = 0$ ), then autocrats enjoy a larger private goods advantage vis-a-vis domestic challengers than do their democratic counterparts. That is, stated formally, the term  $R_A \frac{1}{W_A} - \frac{1}{S_A}$  is much larger in autocracies than in democracies. This term is the difference between the private goods utility an incumbent can supply to supporters compared to what a challenger can credibly offer.

In all systems, military victory is the public policy goal. Victory increases the welfare of the winning coalition, and indeed all members of society, by the same marginal amount (that is, 1). Since the marginal impact of private benefits is larger for autocratic leaders than democratic leaders, autocratic leaders are more likely to save their resources and, therefore, do not make an all out effort during conflict. Their reselection is simply more dependent on doling out private goods than it is on policy success, not out of a lack of civic mindedness, but out of an ability to provide individual supporters with more value through private goods than through public policy because their winning coalition,  $W$ , is small. Democratic leaders just have to spread the private goods too thinly for those benefits to exceed the reselection

advantages of successful public policy because  $W$  is large.

One might think that autocrats have an interest in fighting hard to protect the pool of resources they need to distribute as private goods. However, to stay in office, they must only provide more than the challenger can credibly promise. The challenger cannot promise to distribute any resources that have been lost as a consequence of defeat in the war. Therefore, the incumbent autocrat's comparative advantage in distributing private goods and in reserving resources for that purpose remains unaltered following military defeat.<sup>16</sup>

More formally, the probability of reselection, given the international outcome  $z$  of the dispute and the effort level is:

$\%_A(z; g_A) = F \left( 1 + V_A(z) + R_A \left( \frac{1 - g_A}{W_A} + \frac{1}{S_A} \right) \right)$ . Independent of the type of political system, in terms of survival, victory is always better than defeat,  $\%_A(\text{vic}_A; g_A = 0) > \%_A(\text{def}_A; g_A = 0)$ , and  $\%_A(\text{vic}_A; g_A = 1) > \%_A(\text{def}_A; g_A = 1)$ .<sup>17</sup> Yet, leaders also enhance their prospects of survival by retaining resources to disperse among the winning coalition,  $\%_A(z; g_A = 0) > \%_A(z; g_A = 1)$ . Clearly, if war occurs, the best outcome for leaders is to win while retaining their resources and the worst outcome is to lose having exerted extra effort. Leaders face a tradeoff. They want to win, but they also want to retain resources for their supporters. Political institutions shape this tradeoff. The larger the winning coalition, the less salient private goods are in determining whether a leader survives. Hence, all else being equal, leaders with large winning coalitions expend greater effort on a war than leaders with small winning coalitions. Put starkly, democrats are more likely to prefer to spend resources and win rather than retain resources and lose. While autocrats are more likely to prefer to retain resources and lose rather than spend resources and win. Of course under some circumstances, the level of resources is so large relative to the salience of the international dispute that retaining resources is always more important than winning regardless of institutional arrangements,  $F \left( 1 + k + \frac{R_A}{W_A} + \frac{R_A}{S_A} \right) > F \left( 1 + 1 + k + \frac{R_A}{S_A} \right)$ . In words, the leader

of A prefers to retain her resources whenever the share per member of the winning coalition ( $\frac{R_A}{W_A}$ ) is greater than the value of the international good (1). At the other extreme, the salience of the international dispute could be so great that, regardless of their domestic institutional setting, leaders prefer to win rather than retain resources,  $F^{-1} \left( k + \frac{R_A}{W_A} \right) \frac{R_A}{S_A} < F^{-1} + 1 \left( k + \frac{R_A}{S_A} \right)$ . In this extreme circumstance leaders will always devote whatever resources they can to the war effort. The interesting and more general circumstance is when the order of these two terms depends on the institutional details.

As the winning coalition increases in size, the value of any private goods allocation decreases for each recipient. Therefore, the salience of private goods falls relative to the value of successful public policy as  $W$  increases, shifting the leader's inclination from saving resources to making an all out effort. Consider the simple numerical example introduced earlier in which A or B could be a democrat or an autocrat with 100 resources to distribute as private goods or to spend on the war. The democrat's winning coalition includes 501 members while the autocrat's includes only 10. The selectorate sizes are 1000 and 100 respectively. We assume all other terms (e.g.,  $\beta$ ;  $M$ ; etc.) are equal. Under these conditions, for a democrat  $F^{-1} \left( k + \frac{100}{501} \right) \frac{100}{1000} < F^{-1} + 1 \left( k + \frac{100}{1000} \right)$  which implies  $\frac{1}{4}_A(\text{def}_A; g_A = 0) < \frac{1}{4}_A(\text{vic}_A; g_A = 1)$ : For an autocrat,  $F^{-1} \left( k + \frac{100}{10} \right) \frac{100}{100} > F^{-1} + 1 \left( k + \frac{100}{100} \right)$  which implies  $\frac{1}{4}_A(\text{def}_A; g_A = 0) > \frac{1}{4}_A(\text{vic}_A; g_A = 1)$ : Therefore, a democrat prefers winning the war by spending the available extra resources rather than keeping them for her supporters and losing the war. An autocrat prefers the opposite; keeping the resources even though it means defeat in the war. What matters to both democrats and autocrats is getting reelected. The path to this outcome differs because of their institutional arrangements. Of course, this is not to say that democrats always prefer winning and spending resources over losing but retaining resources; there are parameters where this is not true. Rather, the institutional arrangements that democrats

face make it more likely that they have this preference ordering than autocrats.

Thus far we have shown that effort levels in war influence the probability of reselection and the probability of victory. The differential impact of war effort on the probability of personal political survival varies by political system. We will now show how institutional arrangements influence the level of effort during wartime.

If a leader commits the extra resources to the war effort ( $g_A = 1$ ) then her expected payoff is  $p_A(1 - k + \alpha \frac{1}{4}_A(\text{vic}_A; g_A = 1)) + (1 - p_A)(k + \alpha \frac{1}{4}_A(\text{def}_A; g_A = 1))$ , where  $p_A = p_A(m_A; g_A = 1) = \int_0^R q_A(m_A; m_B; g_A = 1; g_B(m_A)) \mu_B(m_B | \text{war}) dm_B$ . If she does not make the effort ( $g_A = 0$ ) then she expects to receive  $p_A^0(1 - k + \alpha \frac{1}{4}_A(\text{vic}_A; g_A = 0)) + (1 - p_A^0)(k + \alpha \frac{1}{4}_A(\text{def}_A; g_A = 0)) + \frac{R_A}{W_A}$ , where  $p_A^0 = p_A^0(m_A; g_A = 0) = \int_0^R q_A(m_A; m_B; g_A = 0; g_B(m_A)) \mu_B(m_B | \text{war}) dm_B$ .

Institutional arrangements affect the relative magnitude of these terms, as described above. To see this we split each equation into two parts and compare the effects of different institutional details. The first term ( $p_A(1 - k + \alpha \frac{1}{4}_A(\text{vic}_A; g_A = 1))$ ) is the expected payoff for the incumbent if nation A wins the war. The second term ( $(1 - p_A)(k + \alpha \frac{1}{4}_A(\text{def}_A; g_A = 1))$ ) is the incumbent's expected payoff following military defeat. Notice that  $\frac{1}{4}_A(\text{def}_A; g_A = 1)$ , the probability of reselection, is small given that a leader's nation is defeated in the war after she makes an all out effort. Therefore, the value of the second term is close to  $(1 - p_A)(k)$ . As previously demonstrated, military victory is a more important determinant in reselection of democratic leaders than of autocratic leaders. Thus, for a democrat the first term is approximately  $p_A(1 - k + \alpha)$ . So the approximate value of an all out effort for a democratic leader is  $p_A(1 - k + \alpha) + (1 - p_A)(k) \approx p_A(1 + \alpha) - k$ .

If a democratic leader makes no additional effort in the war, then her expected payoff is  $p_A^0(1 - k + \alpha \frac{1}{4}_A(\text{vic}_A; g_A = 0)) + (1 - p_A^0)(k + \alpha \frac{1}{4}_A(\text{def}_A; g_A = 0)) + \frac{R_A}{W_A}$ . The first term represents the incumbent's rewards associated with victory in the war:  $p_A^0(1 - k + \alpha \frac{1}{4}_A(\text{vic}_A; g_A = 0))$ . Since the democratic leader relies on public policy

success as shown, this reduces to approximately  $p_A^0(1 - k + a)$ . In the second term, the payoff associated with defeat, the leader has saved resources to distribute to her supporters. Yet, given her large winning coalition, these private benefits cannot compensate for her foreign policy defeat. Therefore, the second term is approximately  $(1 - p_A^0)(k)$ . The third term  $(\frac{R_A}{W_A})$  represents the leader's personal share of the winning coalition's private benefits, which is small given that  $W$  is large. Consequently, a democratic leader who does not try hard in war, receives approximately  $p_A^0(1 - k + a) + (1 - p_A^0)(k) + \frac{R_A}{W_A} \approx p_A^0(1 + a) - k + \frac{R_A}{W_A}$ .

Given these payoffs, does a democratic leader commit to a large effort during war? The utility from an all out effort is the larger provided that  $p_A(1 + a) \geq p_A^0(1 + a) + \frac{R_A}{W_A}$ . Alternatively stated, democratic leaders try hard if  $p_A - p_A^0 \geq \frac{R_A}{W_A(1 + a)}$ . The right hand side of this inequality is likely to be small when the winning coalition is large. The left hand side is strictly positive because  $p_A$  is the probability of victory associated with an all out effort and  $p_A^0$  is the probability of victory when the leader makes no additional effort.

The decision to make extra effort in a war is different for an autocrat. We demonstrate this difference by replicating the discussion for the decision by democratic leaders, now evaluating the same considerations when the leader is an autocrat; that is, someone with a small winning coalition. When an autocrat tries hard, as with a democrat, the payoff is associated with two contingencies, victory and defeat and their attendant impact on reselection. The first of these terms is  $(p_A(1 - k + a) - \frac{1}{4}(\text{vic}_A; g_A = 1))$ . Although the decision to try hard makes the autocrat more likely to succeed internationally, her reselection is not determined primarily on the policy dimension. As explained earlier, the leader is more able to insure reselection by satisfying her supporters' desire for private goods than by providing successful foreign policy. As can be seen from the numerical example above, a challenger can offer a superior package to the selectorate (including, especially, members of

the current winning coalition) than can the incumbent. The challenger's self-interest dictates that he will concentrate on providing private goods, depriving the incumbent of his inherent advantage on that dimension. The incumbent has lost that advantage because she put all of her relevant resources into the war effort instead of reserving them as private rewards for supporters. This makes it difficult for her to retain office even with a successful resolution of the foreign policy dispute. If it is correct, as Goemans (1995) indicates, that autocrats who lose office are more likely to be killed than are democrats who lose office, then an autocratic incumbent has an increased incentive to reserve resources for private goods rather than trying hard to win the war. As we have just seen, spending extra resources on the war effort makes it harder for the autocratic incumbent to stay in office even if she wins the war, so that trying hard raises the risk of ouster and, as Goemans claims, of being killed. Her expected payoff if she tries hard in the war is approximately  $p_A(1 - k) + (1 - p_A)(j - k) \frac{1}{4} p_A i - k$ .

If an autocratic leader makes no additional effort in the war, then her expected payoff is  $p_A^0(1 - k + \frac{a}{4} (vic_A; g_A = 0)) + (1 - p_A^0)(j - k + \frac{a}{4} (def_A; g_A = 0)) + \frac{R_A}{W_A}$ . Given the small size of the winning coalition, the incumbent can always offer a package that is superior to what the challenger can provide. This is true because the incumbent has reserved private goods to pay off supporters. Since her political survival is dependent on private goods allocations rather than international policy performance, except in extreme circumstances, her expected payoff is approximately  $p_A^0(1 - k + \frac{a}{4}) + (1 - p_A^0)(j - k + \frac{a}{4}) + \frac{R_A}{W_A} \frac{1}{4} p_A^0 i - k + \frac{a}{4} + \frac{R_A}{W_A}$ .

Given these payoffs, does an autocrat commit to a large effort during war? The leader is better off retaining her resources for distribution as private goods provided that  $p_A^0 i - k + \frac{a}{4} + \frac{R_A}{W_A} \geq p_A i - k$  or equivalently,  $\frac{a}{4} + \frac{R_A}{W_A} \geq p_A i - p_A^0$ . Unless the impact of additional effort on the probability of victory is huge, the autocrat is better off retaining her resources. This is evident because the private goods term on the left hand side is large when the winning coalition is small and the value of office ( $a$ ) is

assumed to be important to all leaders regardless of regime type.

The deduction from our model that democratic leaders try harder in wars than do autocrats is, we believe, a novel theoretical result. It is interesting to note, therefore, that others have reported empirical evidence that fits our deduction. Rosenthal (1998) finds a 'selection effect': parliamentary governments, for example, fight fewer wars. They are only willing to fight wars that are profitable, and they are more willing to adequately finance, and therefore more likely to win, the wars they choose to sponsor. His conclusion is reinforced by the argument of Levi (1998), which explores the impact of increased democratization and industrialization upon military mobilization. Faced by an increase in both variables, she argues, governments have to invest more in convincing their populations of the importance of the war and in winning their consent to fight." (in Bates et al, 1998, p. 7.) That is, democratic leaders invest their effort and resources in mobilizing their societies to produce the public good of victory in war, as predicted. Lamborn (1991) presents additional direct evidence for the deduction that democracies try harder in war. He shows that before World War I, Germany devoted a larger percentage of its gross national product to the military than did Britain or France. Nevertheless, the latter countries defeated Germany in the First World War; that is, they mobilized greater resources once the war began because they were better able than the Germans to increase revenue extraction for the war effort.

We have demonstrated that the incentives of leaders in war differ as a function of their institutional arrangements. Although we have explained the reasoning in the special case where all prospective private goods resources are either spent on the war effort or are saved to pay off supporters, it should be evident that the logic holds in the more general setting. We have also focused our attention on conditions under which institutional differences cause democrats and autocrats to behave differently. There are conditions under which either both try hard or neither tries hard. Yet, the

general conclusion is clear. All else being equal, institutional arrangements provide democratic leaders with greater incentives to try hard relative to autocrats. To show how this influences the empirical regularities associated with the democratic peace we now assess the incentives to negotiate rather than fight.

## THE DECISION TO NEGOTIATE OR TO FIGHT

Before presenting the results formally, we sketch the intuition behind the arguments that follow. We now know how nations are expected to behave once a war starts. The influence of institutions on war effort has been shown. Democrats typically try harder than autocrats. This result is crucial to understanding the decision to fight or negotiate.

Leaders in states with large winning coalitions cannot easily compensate for policy failure by doling out private goods. They need to succeed in foreign and domestic policy. Leaders in systems with small winning coalitions can more readily compensate for policy failure by providing private benefits to their few key backers. Therefore they do not try as hard in wars as do their more democratic counterparts. A consequence of this is that democracies are less attractive targets of war than are autocracies. By the same token, democracies are not eager to pursue wars that they do not expect to win. Their leaders are at great risk of political defeat at home from failed policies. Autocrats are not.

It follows that democratic leaders generally only attack when they anticipate victory. They are highly selective; they prefer to negotiate when they do not anticipate military success. This does not imply that they are reluctant to fight. Democracies, because of their propensity to try hard, can often overwhelm their foe. This carries an important implication for the type of foe they can fight and defeat. Autocrats do not try as hard in war and so make attractive targets for democracies. In contrast, democracies are unlikely to be willing to fight each other. Since both try hard, each

minimizes, to the extent possible given their resource endowments, the chance that the other will win. Since democrats need to be overwhelmingly confident of victory, it is difficult to satisfy the conditions necessary for them to fight each other.

Autocrats do not depend upon military victory to keep their jobs. Of course, they prefer winning to losing, but their political (and personal) survival is primarily a function of satisfying their small band of supporters rather than providing their citizens with successful policies. They are more willing to gamble on war than their democratic counterparts. So, the chance of success in war required for an autocrat to take the risk is considerably lower than it is for a democrat. The latter's political survival is on the line; the former's is not. Thus, it is straightforward to see that democracies and autocracies can fight wars against each other and that autocracies can afford to fight one another.

Having outlined the intuition of what is to follow, we develop these results formally. If the nation led by A starts a war with the nation led by B then A's payoff is its chance of winning times what its utility for winning plus the chance it loses times its utility for losing plus the value of the private goods retained after choosing a level of war effort:

$$U_A(\text{fight}; m_A; g_A) = p_A(1 - k + \alpha \frac{1}{4} (v_{iC_A}; g_A)) + (1 - p_A)(1 - k + \alpha \frac{1}{4} (d_{eF_A}; g_A)) + (1 - j - g_A) \frac{R_A}{W_A}, \text{ where } p_A = p_A(m_A; g_A) = \int_0^1 q_A(m_A; m_B; g_A; g_B(m_A)) \mu_B(m_B; j, w, r) dm_B.$$

Via negotiations, A expects a payoff of  $U_A(\text{nego}) = M + \alpha \frac{1}{4} (n_{ego}) + \frac{R_A}{W_A}$ . Leaders only initiate fighting if their expected payoff from attacking is higher than the payoff they expect to receive at the negotiation table. Because of the differences in relative importance of private goods and policy performance between the democratic and autocratic systems, the conditions under which leaders choose to fight vary. We start by exploring the incentives for democratic leaders.

Since democratic leaders typically make a greater effort in the logic of our model, as well as in the empirical evidence amassed by Lamborn (1991), Rosenthal (1998),

Levi (1998) and Reiter and Stam (1998a, b), and their political survival depends on policy success, then the value of fighting reduces to approximately  $p_A(1 - k + a) + (1 - p_A)(1 - k) \approx p_A(1 + a) - k$ . Rather than fighting, the leader could reduce the risk of policy failure by seeking a negotiated resolution of the dispute. For now we will assert that the probability of reselection following negotiations is reasonably high for all leaders, whether the winning coalition is large or small. Later we explore the robustness of our results in light of variation in this condition. The payoff from negotiations for a democratic leader, is approximately  $M + a + \frac{R_A}{W_A}$ :

Democratic leader A chooses fighting over negotiation provided that  $p_A \geq \frac{M + a + k}{(1 + a)} + \frac{R_A}{(1 + a)W_A}$ .<sup>18</sup> The second term on the right hand side is generally small in democratic regimes because the denominator contains the size of the winning coalition which is large. The first term tends toward 1 as the value of office holding increases. Since we have assumed that office is valuable, this means that democratic leaders only initiate wars when they are extremely confident of military victory. Otherwise, they rather negotiate.

As an aside it is interesting to note what the above theoretical result implies about the willingness of democratic leaders to use violence as the means to advance their objectives. Autocracies may engage in imperialist expansion, for instance, out of a quest for additional private goods. Democracies can also be expected to participate in imperialist expansion, according to our model, provided that doing so enhances the survivability of incumbents. The targets during wars of colonial and imperial expansion typically are very weak states or peoples who can easily be defeated. While the norms-based argument that democracies use violence to protect their survival against nondemocratic foes who do not share the abhorrence of violence might account for some democratic-autocratic wars, it seems to be contradicted by wars of colonial or imperial expansion by democracies. Certainly the weak foes in such wars did not threaten the survival of the democratic belligerent. Yet, our model shows that such

extremely weak opponents readily fulfil the requirements to be targets of democratic initiations of violence. Democracies, according to our model, initiate fighting when their prospects of victory are a near certainty. So, democracies, like autocracies, are not immune from the temptations of colonial and imperial expansion according to our model. Near certainty of victory, not normative commitment to peaceful resolution of disputes, describes when democracies go to war.

The democratic propensity to try hard makes it difficult for either side of a democratic dyad to overwhelm the other. Being unable to guarantee victory, both sides of a democratic dyad seek to avoid what is likely to be a long, bloody and protracted conflict. The exception to this claim arises when one party in the dyad is much weaker than the other. In that case, large democracies are not immune from attacking small democracies, but small democracies are expected to sue for peace rather than fight back. This follows in the model because democracies need a high probability of victory in order to fight. Therefore, large democracies are prepared to fight weak adversaries, including democracies, but the weak democrats, having a low probability of victory, are unwilling to fight back. This results in cases of low-level, one-sided attacks by big democracies against small ones (e.g., the United States attacked the Dominican Republic in 1965), a phenomenon widely observed in the historical record. This also accounts for the proclivity of democracies to have been imperialist powers.

The situation for autocrats regarding the required probability of victory to wage war is somewhat different. As we have already shown, autocrats generally retain their resources to distribute amongst their supporters. They do not spend them on the war effort. Hence, an autocrat's payoff for attacking is approximately  $p_A^0(1 - k + a) + (1 - p_A^0)(k + a) + \frac{R_A}{W_A} \frac{1}{4} p_A^0(k + a) + \frac{R_A}{W_A}$ . Providing the autocratic leader retains her resources to reward her supporters she is likely to survive domestically, whatever the international outcome. If there is a negotiation, then autocrat A's payoff reduces to  $M + a + \frac{R_A}{W_A}$ . Therefore, the autocrat chooses to fight rather than negotiate

provided that  $p_A^0 \geq k > M$ ; that is, the probability of victory without trying hard, less the costs of fighting, exceeds A's expectation from negotiations.

Let us summarize how institutional arrangements affect the choice between war and negotiation. In systems with large winning coalitions, the domestic consequences of foreign policy failure causes leaders to initiate conflict only if they anticipate military victory. Otherwise, they get turned out of office with a high probability. By contrast, leaders in systems with smaller winning coalitions can more readily survive disastrous policy outcomes. Consequently, they are more willing to undertake foreign policies that are risky in terms of their nation's welfare, though not their own. These factors shape the interaction between different polities. We now turn to an explanation of that interaction.

### The Interaction of Polities

The simplest case is that of two autocracies in a dispute so we begin there. Autocrat A attacks if  $p_A^0 \geq k > M$  and autocrat B attacks if  $p_B^0 \geq k > (1 + M)$ . In general neither autocrat tries hard, so  $p_A^0(m_A) = \int_0^1 q_A(m_A; m_B; 0; 0) \mu_B(m_B | \text{war}) dm_B$ . If A initiates then it does not learn about B's types which, you recall, depends on B's intangible resources ( $m_B$ ). Hence A has no opportunity to update her beliefs, so they remain  $\mu_B(m_B | \text{war}) = 1$ : Autocrat A attacks if  $\int_0^1 q_A(m_A; m_B; 0; 0) dm_B \geq M + k$ . When autocrat A believes that she is stronger than the observable military balance suggests, then she anticipates a larger reward from fighting than from negotiations. Under these conditions, autocrat A fights. Similarly, autocrat B initiates a war when his intangible assets, and hence his probability of military victory, are large. That is, autocrats A and B rely upon their intangible assets, which are unobserved by the adversary before fighting commences, to substitute for the private goods resources that they have withheld from using in the war. So, two autocrats will fight each other providing at least one side is reasonably confident of victory. Autocrats do not

want to lose. Because each is an autocrat, they can generally rely on the expectation that the other will not be committing additional known resources ( $g_A; g_B$ ) to the war effort. War occurs between autocrats when at least one believes that the observable military balance understates his or her true military advantage, making war more appealing than negotiation.

The situation is different when the prospective military contest is between an autocrat A and a democrat B or, equivalently, between a democrat A and an autocrat B. At a superficial level, many autocracies, particularly military dictatorships, appear to have the upper hand over democracies in terms of the military balance. On the whole, military states invest in their armed forces at a higher rate than democracies. Yet this belies the purpose of military spending. As demonstrated above, democratic leaders spend resources on effective public policy. In contrast, spending in autocracies is focused on the provision of private goods. Although military dictators might invest vast proportions of their resources into the military, this is typically to reward their supporters rather than as a policy to provide effective defense. Recent military conflicts bare out these arguments. During the Gulf war, Saddam Hussein kept his best equipped units, the Republican guards, removed from the fighting, choosing instead to let conscripts face the brunt of the US military. He did so, not from a military stand point, but from a political one. The Republican guards defend the regime; their leaders are certainly members of the winning coalition in Iraq. Similarly, during the Falklands war with Britain, the Argentine military Junta neither garrisoned the Falklands with their best troops nor put their fleet to sea. Again, by and large, it was raw recruits, not seasoned soldiers, that faced the British forces.

As in the case of two autocrats, if A is an autocratic leader, she will attack only if  $p_A^0 | k > M$ . The value of  $p_A^0$ , all else being equal, is lower when B is a democrat than when B is an autocrat because democrats typically try harder, spending extra effort on the war. Therefore, A must believe it has a very large intangible military advantage in

order to initiate a war against a democrat. This is because A's intangible advantage is offset by the extra effort that a democrat is likely to make. On the whole, unless the autocrat believes it has particularly large intangible assets, the theory indicates that democrats generally make unattractive targets for autocrats.

Suppose that nation A is a democratic leader and B is an autocratic incumbent. Under what conditions will A attack B? If A attacks, while trying hard as expected of a democrat, then her payoff is approximately  $p_A(1 + a)j - k$ . If A does not attack and negotiations follow then her expectation is approximately  $M + a + \frac{R_A}{W_A}$ . Democrat A requires a high probability of victory as demonstrated earlier. This does not imply that democrat A will never attack. Quite the contrary. It implies that she will be selective about her targets. Democrats attack only when they believe they have a sufficient military advantage to win. Since autocrats do not generally try hard, the resources they bring to bear in a fight are their observable capabilities and their intangible assets. Democracies bring their observable capabilities, intangible assets, and additional effort to the battlefield. Provided autocracies are not generally in possession of much larger intangible assets than democracies, autocracies make attractive targets for democracies. The difference in effort level brought about by the incentives of their respective institutional arrangements gives democracy, on average, a military advantage if they choose to fight. Indeed, they choose to fight only when they believe they have that overwhelming advantage. That is how they select their fights! Because their beliefs will usually be borne out due to their extra effort, democracies are likely to win when they initiate wars against autocracies.

We have now established that autocracies fight one another provided either one believes it has a consequential advantage; autocracies are more reluctant to initiate wars against democracies because of the difference in levels of effort, though they are not precluded from doing so when the conditions in the model are right; and democracies target autocratic states just under those circumstances when the democracy

expects to win although this is more often than we might naively suppose because of the effort advantage induced by democratic institutions. The latter two results suggest an explanation for Benoit's (1996) finding that democracies are overall more pacific than other systems. They also explain Bennett and Stam's (1998) finding that democracies are more likely to initiate war against autocracies than are autocracies to initiate war against democracies. We now move to the heart of the democratic peace and explain why pairs of democracies have such a low propensity to fight.

The institutional arrangements within democracies means that the survival of democratic leaders depends more upon policy success than upon the provision of private goods to supporters. Given this, once engaged in a war, democratic leaders typically make every effort to win. Should a war break out between two democracies, it is likely to be a bloody and hard fought affair, both sides utilizing every available resource. As we have already shown, democratic leaders, not wanting to risk their political tenure in office, are reluctant to engage in a war unless they are extremely confident of winning. As we saw above, against autocracies, democratic leaders can often almost assure themselves of victory by their willingness to try hard. Yet, when matched against a democracy, democratic leaders find it harder to overwhelm their opponents, who, given the institutional arrangements they face, are also prepared to go the extra mile for policy success. Since victory has to be a near certainty in order for a democracy to fight rather than negotiate, it is extremely difficult for either democracy to have a sufficiently large advantage so that it prefers fighting to negotiation. Consequently, democracies are highly likely to negotiate a resolution of their mutual disputes rather than fight. Only democratic leaders who do not value highly holding on to office are willing to fight when the perceived odds of victory are not extremely high.

Our model supports the claims that democracies tend not to fight one another, but do tend to initiate wars against autocracies provided the democratic state has a

substantial probability of victory. We also saw that our logic indicates that autocracies can readily fight one another and that autocrats are less inclined to negotiate than are democrats. So, while we began with eight observed empirical regularities of interest, we have shown how institutional arrangements explain the first five empirical patterns. While the latter three regularities have not been explicitly discussed thus far, the model can readily be directed to address these questions too.

It is commonly assumed and has been demonstrated empirically that the costs a nation endures in war and the length of time it takes a nation to win are inversely related to its military dominance (Bennett and Stam, 1996; Bueno de Mesquita, 1983; Siverson 1995). If this is so, then nations that overwhelm their opponents are likely to win quickly and suffer fewer casualties in the process. As we have shown, democracies tend to make the greater effort. Therefore, on average, we should expect them to win quickly and to have lower casualties, as has been observed. Although the relationship between costs and relative military dominance is outside the formal framework of our model, it further reinforces our findings. Democracies find it hard to overwhelm other democracies because both sides are prepared to make an all out effort during the war. Hence, a war between democracies is likely to be a long and costly struggle. Since the survival of democratic leaders depends upon public policy success, they typically want to avoid long and costly wars.

Mansfield and Snyder (1995) suggest that transitional democracies are not bound by the democratic peace. Rather, unstable, transitional democracies are more war prone than are democracies or autocracies according to them. As we noted at the outset, their observation is monadic and our theory is dyadic. Still the model may shed some light on the regularity they have advanced. Elsewhere we report on the endogenous selection of institutions (Bueno de Mesquita et al, 1998) using a variation of the model discussed here. We find there is a larger set of conditions under which there are incentives to expand the size of the electorate than there are to

expand the size of the winning coalition. If states in transition to democracy expand their selectorate faster than they expand their winning coalition, then the winning coalition falls below its optimal size. In that case, the model suggests that the existing government is highly susceptible to being overthrown by foreign or domestic rivals, producing high levels of instability. These suggestive findings seem compatible with the regularity advanced by Mansfield and Snyder (1995). This explanation is reinforced by Ward and Gleditsch's (1998) result that, rather than all transitional democracies being war prone, it is those undergoing reversal in the democratization process that are most apt to fight. This is an avenue of research we continue to pursue, mindful that current results are consistent with but inconclusive at this stage regarding the hypothesis about transitional democracies.

At the outset we said that we could not systematically evaluate Morgan and Campbell's (1991) monadic observation that large democracies appear particularly constrained, but that we could indicate how it might be consistent with our theory. We do so now, mindful that their result does not address the resources or institutional constraints of the adversary in war. Major power democracies typically have a significant advantage over their opponents in terms of the military balance. This enhances their bargaining position relative to smaller, less powerful democracies. Powerful democracies can use their advantageous bargaining position to obtain nearly everything they want anyway. Even if certain of victory, the small additional gains made through military victory are likely to be offset by the costs of fighting. Therefore, powerful democracies should strongly manifest the expected behavior of democracies in a manner consistent with the Morgan and Campbell monadic results.

## COMPROMISE AGREEMENTS: RELAXING THE NEGOTIATIONS RESELECTION ASSUMPTION

Although we present a general model of war, for clarity of exposition, we focused on particular cases. These stylized cases suggest that democracies are only aggressive if they are nearly certain of victory. When the outcome of the war is less certain, democracies prefer negotiated settlements. Since this conclusion drives the democratic peace predictions, it is worthwhile exploring its robustness.

Why do democrats only attack when they expect to win, preferring to negotiate otherwise? In general, it is much harder for democrats to remain in office than autocrats because they require the continued support of a large group. It is difficult to buy the support of such a large group with private benefits and so democrats must resort to providing good policy outcomes. Thus, democratic leaders, unlike autocratic leaders, are at risk when their foreign policies fail. Under most conditions this means that a democratic leader is most likely to keep her job if she wins, and least likely to survive if she loses:  $\frac{1}{4}_A(\text{vic}_A; :) > \frac{1}{4}_A(\text{nego}; :) > \frac{1}{4}_A(\text{def}_A; :)$ .

To make the comparison sharp, we focused on cases in which defeat leads to certain dismissal for democrats and victory leads to certain retention. Yet, it is not always true that leaders are in such a strong position that they only need to avoid failure to ensure reselection. If leaders perform poorly on other policy issues, low  $\beta$  in the context of the model, then a mediocre negotiated foreign policy is unlikely to be sufficient for domestic survival. This creates an incentive for leaders to bypass negotiations and wage war, staking their domestic survival on the outcome (Downs and Rocke 1993; Levy 1989 ; Smith 1996; Werner 1996 ; Goemans 1995; Richards et. al. 1993). Thus, democratic leaders constrained by poor policy performance on other issues are belligerent, waging war at any opportunity. However, a belligerent democratic leader still interacts differently with autocrats than with democrats. First,

democrats try harder and so are harder to defeat. In this context, autocrats still make preferable targets. Even when looking for a fight, democratic leaders look to fight autocrats. Second, even if two democrats become involved in a dispute and one leader is domestically constrained (by a low value of  $\beta$  in terms of our model), typically they can still negotiate a settlement. It is the logic behind this statement that we explore next.

Negotiations are complex. However, the outcome of negotiations is likely to reflect the relative observable strength of the participants as assumed here. This is the assumption underlying the Nash bargaining solution and much of cooperative game theory. Claims about unobservable capabilities are just cheap talk. Real intangible resources can only be credibly revealed by fighting. The objectives of leaders during negotiations differ depending on their institutional arrangements. Since autocratic leaders survive whatever the policy outcome, providing they do not squander their resources, they simply seek to maximize their gains from the process. Democratic leaders face different pressures. It is harder for them to keep their jobs if they perform poorly on policy. They would like to get a good deal for their nation through negotiations, but they only need a deal good enough for them to be reelected. If the negotiations break down then the democrat must be militarily successful to satisfy domestic policy wants and to survive politically. Hence, a democratic leader might be prepared to accept a modest negotiated settlement rather than allowing the negotiations to break down and risk being removed by failure during war. This is particularly true if the democrat is faced with a democratic rival, because the rival will try hard in any war. Again, then, we see that democrats are unlikely to fight one another; they are likely to look for ways to succeed through negotiations even if it means that one makes additional concessions to avoid a breakdown.

For autocrats the story is different. Autocrats survive domestically by providing private goods. Unless the international outcome is really horrendous, it is unlikely

to influence their reselection prospects. So they do not have a great incentive to avoid the breakdown of negotiations. They have a smaller incentive than democrats to make additional concessions in negotiations to avoid a war against a belligerent foe. While domestic policy failures make domestic leaders belligerent, autocrats find it less important to keep negotiating than do democrats. Democratic leaders are destined to fight each other only when neither is able to make additional concessions. This circumstance arises only when both have domestically failed policies. The same motivations exist for autocrats, but these incentives are not as strong since autocrats are surer of reselection whatever the international outcome.

## CONCLUSIONS

We have posed a simple model. In it, leaders are assumed to be motivated by a desire to keep their jobs. They allocate resources toward the pursuit of public policies that benefit all citizens and toward private goods that benefit only their key supporters. We claimed that when a member of the winning coalition defects from the incumbent leadership, the defector puts her access to private goods at risk. That risk was assumed to increase as the selectorate increases in size and to decrease as the winning coalition increases in size.

The institutional arrangements of political systems influence the incentives of leaders to provide different kinds of policies. We examine the link between institutions and policy choices in the context of international disputes. We demonstrated that democratic leaders, when faced with a war, are more inclined to shift extra resources into the war effort than are autocratic leaders. This was shown to follow because as the winning coalition gets larger, the prospects of political survival increasingly hinge on successful policy performance. The extra effort made by democrats gives them a military advantage over autocrats in war. Additionally, we have shown that democratic leaders only choose to fight when they are very confident of military victory.

Otherwise, they prefer to negotiate.

We have shown that democrats make relatively unattractive targets. Domestic reselection pressures cause leaders to mobilize resources towards the war effort. This makes it harder for other states to target them for aggression. In addition to trying harder, democrats are also more selective in their choice of targets. Since defeat typically leads to domestic replacement for democrats, these leaders only initiate wars when they expect to win. These two factors lead to the interactions between polities that is often referred to as the democratic peace. Autocrats while needing a slight expected advantage over other autocratic adversaries to initiate conflict, need more overwhelming odds against democratic foes. This is true because democrats compensate for any initial military disadvantage by devoting additional resources to the war effort. In order to initiate war, democrats need overwhelming odds of victory. However, this does not mean that they are passive. Because democrats utilize their resources for the war effort rather than reserving them to reward their backers, they are generally able, given their war fighting selection criteria, to overwhelm autocracies, resulting in short and relatively low cost wars. Yet, democracies find it hard to overwhelm other democracies because they also try hard. In general, democracies make unattractive targets. They are particularly unattractive to other democracies. Hence, democratic states rarely attack other democratic states.<sup>19</sup>

One concern about what is termed the democratic peace is that it has lacked a comprehensive explanation. Explanations based on norms or on constraints account for some of the democratic peace regularities, but they do not explain all. The model here appears to offer a more comprehensive account. Two novel hypotheses follow; that democracies try harder and that political incentives in democracies do not make them immune from wars of imperial expansion. We cited evidence from other studies for the former result. The latter is well known as a fact, but seems to contradict core parts of the norm-based explanations of the democratic peace. The model we propose

offers an explanation for these diverse phenomena without attributing better motives or greater civic mindedness to one kind of leader over another. The explanation is driven purely by self-interested leaders seeking to hold office and facing alternative institutional arrangements.

## APPENDIX

### Structure of the game

1. The leader in each nation chooses whether to fight or to negotiate. At the moment of choosing, neither knows the others choice.
2. If either, or both, leaders fight then a war occurs. Negotiations occur only if neither side attacks.
3. If a war occurs, then the leaders in both nations simultaneously choose an effort level. By this we mean that leader A allocates a proportion,  $g_A$ , of her available resources,  $R_A$ , to the war effort. The remaining  $(1 - g_A)R_A$  resources are distributed evenly amongst to the members of the winning coalition in nation A. The leader in nation B makes an analogous choice.
4. Nature stochastically determines which nation wins the war. The probability that A is victorious,  $q_A$ , depends upon the observable military balance,  $M$ , each nation's intangible assets,  $m_A$  and  $m_B$ , and each nation's chosen effort level,  $g_A$  and  $g_B$ .
5. In each nation, the members of the winning coalition, having observed the international outcome and the level of private goods allocated decide whether to retain the incumbent leader or defect, removing the current leader from office.

The level of nation A's intangible military assets,  $m_A$ , is private information known only to the leader in nation A. Let  $\mu_A(m_A|h)$  represent B's beliefs about A's type following the history of play  $h$ . A history of play,  $h$ , is simply the list of previous play that the leader has observed. The leader in nation B, although not knowing the realized value of  $m_A$ , knows the distribution from which it is drawn. For simplicity, we assume that these prior beliefs are uniformly distributed over the unit interval.

Leader A's strategy is a pair  $(\beta_A; \sigma_A) = (\beta_A(m_A); \sigma_A(g_A | m_A; h))$ . Where  $\beta_A(m_A)$  represents the probability that a leader with  $m_A$  intangible assets launches a war against B and  $\sigma_A(g_A | m_A; h)$  is the probability that leader A allocates  $g_A$  proportion of her available resources to the war effort given that her type (intangible military assets) is  $m_A$  and the previous history of play is  $h$ . In the analysis, the history of play is relevant to A's effort decision because whether nation B started the war influences A's beliefs about the type of opponent she is dealing with. If A did not start a war, but one occurs, then A must infer that nation B started it ( $h = \text{WAR}_B$ ). If A started a war, then she cannot tell whether B also started the war ( $h = \text{WAR}_A$ ). The findings are robust to relaxing this assumption. There are analogous terms associated with nation B.

### Perfect Bayesian Equilibria

The triple  $((\beta_A; \sigma_A); (\beta_B; \sigma_B); (\mu_A; \mu_B))$  is a Bayes perfect equilibrium, where  $(\beta_A; \sigma_A)$  represents A strategy choice,  $(\beta_B; \sigma_B)$  represents B strategy, and  $(\mu_A; \mu_B) = (\mu_A(m_A | h); \mu_B(m_B | h))$  represents beliefs about A's and B's type, if and only if the following conditions hold:

1.  $\beta_A$  is utility maximizing given A's type,  $m_A$ , the strategies  $\sigma_A$ ,  $\beta_B$ , and  $\sigma_B$ , and A's beliefs about B's type,  $\mu_B(m_B)$ .
2.  $\sigma_A$  is utility maximizing given A's type,  $m_A$ , B's strategy  $\sigma_B$ , and A's beliefs about B's type,  $\mu_B(m_B | h)$ .
3.  $\beta_B$  is utility maximizing given B's type,  $m_B$ , the strategies  $\sigma_B$ ,  $\beta_A$ , and  $\sigma_A$ , and B's beliefs about A's type,  $\mu_A(m_A)$ .
4.  $\sigma_B$  is utility maximizing given B's type,  $m_B$ , A's strategy  $\sigma_A$ , and B's beliefs about A's type,  $\mu_A(m_A | h)$ .

5. The beliefs held by both players,  $(\mu_A; \mu_B)$ , are consistent with Bayes rule, where defined.

### Characteristics of PBE.

If triple  $(\sigma_A; \sigma_B; (\mu_A; \mu_B))$  is a Bayes perfect equilibrium, then:

$$\sigma_A(m_A) = \begin{cases} 1 & \text{if } -_A(m_A; \sigma_B; \sigma_A; \sigma_B) > 0 \\ [0; 1] & \text{if } -_A(m_A; \sigma_B; \sigma_A; \sigma_B) = 0 \\ 0 & \text{if } -_A(m_A; \sigma_B; \sigma_A; \sigma_B) < 0 \end{cases}$$

where  $-_A(m_A; \sigma_B; \sigma_A; \sigma_B)$  is defined below, and  $\sigma_A(g_A | m_A; h) > 0$  only if  $g_A(m_A; h) =$

$$2 \arg \max_{g_A \in [0; 1]} p_A (1 + \alpha ( \frac{1}{4}_A(vic_A; g_A) - \frac{1}{4}_A(def_A; g_A) )) + (1 - g_A) \frac{R_A}{W_A},$$

$$p_A = p_A(m_A; g_A) = \int_0^1 \int_0^1 \sigma_B(g_B | m_B; h) q_A(m_A; m_B; g_A; g_B(m_B)) \mu_B(m_B | h) dm_B dg_B.$$

Note that where it is not essential we drop history dependence from notation. If B's effort decision is a pure strategy then the later term reduces to

$$p_A = \int_0^1 q_A(m_A; m_B; g_A; g_B) \mu_B(m_B | h) dm_B.$$

Analogous conditions apply to B's strategy.

We now examine the role of beliefs, what these statements mean and derive the function  $-_A(m_A; \sigma_B; \sigma_A; \sigma_B)$ .

A's beliefs about B's type,  $\mu_B(m_B | h)$ , depend upon whether A started the war. There are two relevant histories to consider:  $h = WAR_A; WAR_B$ . If A chose to fight and thereby started the war ( $h = WAR_A$ ), then she does not know whether B also chose to fight and start the war, therefore she can not update her prior beliefs:  $\mu_B(m_B | WAR_A) = \mu_B(m_B) = 1$ . If A did not start the war, but a war occurs, then nation B must have started the war ( $h = WAR_B$ ). By Bayes rule, if A observes B start the war then  $\mu_B(m_B | WAR_B) = \frac{\int_0^1 \sigma_B(m_B) \mu_B(m_B) dm_B}{\int_0^1 \sigma_B(m_B) \mu_B(m_B) dm_B}$ . There are analogous definitions for B's beliefs about A. The statement about A's effort decision ensures that, given these beliefs, that A chooses an optimal effort level.

Next we consider the incentives to fight. If A attacks B then A can not update her beliefs about her opponent's type. So in the war, A chooses her optimal effort based upon her prior beliefs ( $\mu_B(m_B) = 1$ ). Thus,  $U_A(\text{attack}|m_A) = \int_0^1 U_A(\text{war}|m_A; m_B; \sigma_A; \sigma_B) \mu_B(m_B) dm_B$ , where  $U_A(\text{war}|m_A; m_B; \sigma_A; \sigma_B)$  is type  $m_A$ 's expected payoff against a type  $m_B$  (whose optimal effort is  $\sigma_B = \sigma_B(g_B|m_B; h)$ ) given that A plays her optimal effort ( $\sigma_A = \sigma_A(g_A|m_A; W A R_A)$ ).

Given that type A plays an optimal effort level,  $g_A$ , having attacked,  $U_A(\text{attack}|m_A) = p_A(1 + \alpha (\frac{1}{4}_A(\text{vic}_A; g_A) - \frac{1}{4}_A(\text{def}_A; g_A))) - k + \alpha \frac{1}{4}_A(\text{def}_A; g_A) + (1 - g_A) \frac{R_A}{W_A}$ . The expected probability that A is victorious,  $p_A$ , depends upon B's effort level:  $p_A = \int_0^1 \int_0^1 \sigma_B(g_B|m_B; h) q_A(m_A; m_B; g_A; g_B) dm_B dg_B$ . It is important to note that B's effort decision within this integral,  $\sigma_B(g_B|m_B; h)$ , depends upon B's observed history. Those types that chose to attack are unaware of whether A also made the decision to start the war. However, non-initiating types optimize their effort level given that they know that A is a type prepared to start a war.

If A does not attack, then either B attacks or the dispute is resolved through negotiations. If B attacks ( $h = W A R_B$ ), which happens with probability  $\sigma = \int_0^1 \frac{3}{4}_B(m_B) \mu_B(m_B) dm_B$ , then A's payoff is  $U_A(W A r|m_A; W A R_B) = \max_{g_A \in [0;1]} p_A(1 + \alpha (\frac{1}{4}_A(\text{vic}_A; g_A) - \frac{1}{4}_A(\text{def}_A; g_A))) - k + \alpha \frac{1}{4}_A(\text{def}_A; g_A) + (1 - g_A) \frac{R_A}{W_A}$ , where  $p_A = \int_0^1 \int_0^1 \sigma_B(g_B|m_B; W A R_B) q_A(m_A; m_B; g_A; g_B) \mu_B(m_B|W A R_B) dm_B dg_B$ . Note, A's probability of victory is calculated knowing that B attacked. Negotiations occur with probability  $1 - \sigma = \int_0^1 (1 - \frac{3}{4}_B(m_B)) \mu_B(m_B) dm_B$  and A's payoff is  $U_A(\text{nego}|m_A) = M + \alpha \frac{1}{4}_A(\text{nego}) + \frac{R_A}{W_A}$ . We define  $-_A(m_A; \frac{3}{4}_B; \sigma_A; \sigma_B)$  as the expected difference in payoffs between attacking and not:  $-_A(m_A; \frac{3}{4}_B; \sigma_A; \sigma_B) = U_A(\text{attack}|m_A) - [\sigma U_A(W A r|m_A; W A R_B) + (1 - \sigma) U_A(\text{nego}|m_A)]$ . If  $\frac{3}{4}_A(m_A)$  is part of an equilibrium, then

$$\frac{3}{4}_A(m_A) = \begin{cases} 1 & \text{if } -_A(m_A; \frac{3}{4}_B; \sigma_A; \sigma_B) > 0 \\ [0; 1] & \text{if } -_A(m_A; \frac{3}{4}_B; \sigma_A; \sigma_B) = 0 \\ 0 & \text{if } -_A(m_A; \frac{3}{4}_B; \sigma_A; \sigma_B) < 0 \end{cases}$$

Analogous conditions hold for B.

**Generic Properties of Equilibria** The function  $v_A(m_A; m_B; \theta_A; \theta_B)$ , while characterizing equilibria, provides little intuition about the behavior of nations. In this section, we describe equilibria under most conditions and explain the conditions under which alternative equilibria exist. The main driving force of the analysis is that the expected value of war is increasing in type (intangible assets), but the value of a negotiated settlement is fixed and independent of type.

Which types attack and which prefer to find negotiated settlements? To simplify the discussion, suppose, as will be the case under most circumstances, that it is the high types that attack. i.e. B attacks only if  $m_B \geq \bar{m}_B$ .<sup>20</sup> A's payoff for fighting,  $U_A(\text{attack}|m_A)$ , is:

$$\int_1^{\bar{m}_B} U_A(\text{war}|m_A; m_B; \theta_A)(g_A(m_A; \text{WAR}_A); g_B(m_B))\mu_B(m_B)dm_B + \int_0^{\bar{m}_B} U_A(\text{war}|m_A; m_B; \theta_A)(g_A(m_A; \text{WAR}_A); g_B(m_B))\mu_B(m_B)dm_B \quad (1)$$

In this, and following equations, to reduce notation we have expressed B's effort level as a pure strategy. The first term is the expected payoff of a war against the types of B that also want to attack. The second term is the expected payoff from attacking those types of B that do not want to attack. If A does not attack then her expected payoff,  $U_A(\text{no attack}|m_A)$ , is:

$$\int_1^{\bar{m}_B} U_A(\text{war}|m_A; m_B; \theta_A)(g_A(m_A; \text{WAR}_B); g_B(m_B))\mu_B(m_B)dm_B + \int_0^{\bar{m}_B} U_A(\text{nego}|m_A)\mu_B(m_B)dm_B \quad (2)$$

The first term is the expected payoff from fighting after being attacked by B. The second term is the expected payoff from negotiations. Note that in calculating the first term in each equation, B's effort strategy decision is identical. However, A's

effort decision could differ. In the former equation, A does not know that she is fighting against a high type of B. However, in the latter case she does. Conditional on being matched against a high type, A is better off in the latter case because she can condition her effort decision on this information. Hence, the first term of the second equation is weakly greater than the first term of the first equation.

The expected payoff from a war is increasing in type: high types are more likely to win and need to spend fewer resources to do so. Therefore both terms in the first equation and the first term in the second equation are increasing in type. The payoff from negotiation is constant. Independent of A's choice, she ends up fighting if she is matched against a high type of B ( $m_B \geq \bar{m}_B$ ). Thus, in determining whether A wants to attack, the important comparison is between the second term in each equation. Since the value of fighting is increasing in type, it is the high types that want to fight:  $\frac{3}{4}A = 1$  if  $m_A \geq \bar{m}_A$ , where  $\bar{m}_A$  is the type such that equation 1 and equation 2 are equal. It was this comparison of the second terms that we discussed in the main text.

In general, equilibria are of the form that A attacks only if  $m_A \geq \bar{m}_A$  and B attacks only if  $m_B > \bar{m}_B$ . However, some care must be taken in this statement. The terms  $\int_{\bar{m}_B}^R U_A(\text{war}; m_A; m_B; \theta_A(g_A; m_A; W; A; R_A); g_B(m_B)) \mu_B(m_B) dm_B$  and  $\int_{\bar{m}_B}^R U_A(\text{war}; m_A; m_B; \theta_A(g_A; m_A; W; A; R_B); g_B(m_B)) \mu_B(m_B) dm_B$  are not identical because A's effort decision is made conditional on different information (although B's effort choice in both cases is identical because its information set is the same in both cases). If the marginal impact of this difference varies drastically by type, then there is the possibility of alternative equilibria. We do not systematically examine this possibility for two reasons. First, the relative importance of the first terms in each equation is weighted by the probability of war. Since war is inefficient relative to negotiations, the average types prefers negotiations. It is only a few types that want to fight. Given this low weighting, it is the second terms that dominate. Second, in

the stereotypical systems we consider, the autocracies want to retain their resources and the democracies spend them on the war effort provided that they increase the marginal probability of victory. Since regime characteristics dominate the effort decision, the first terms cancel and the decision to fight is determined by the second terms.

In general, only high types want to fight ( $m_A > \bar{m}_A$  and  $m_B > \bar{m}_B$ ). This result is robust to variation in the model specification. For example, a more complex crisis subgame, sequential rather than simultaneous decisions, assuming leaders allocate resources on a contingent basis prior to the war (or, equivalently, that the effort decision is made simultaneously with the conflict decision), or altering the information assumption about what is revealed generates equilibria with similar structure. Obviously, the math differs but the substantive conclusions remain the same. The underlying incentives are structured by regime characteristics.

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## NOTES

1. Some studies suggests that democracies are, on the whole, more paciꝑc than autocracies (Benoit 1996; Ray 1995). Yet, such general war avoidance can not account for the relative propensity to ight with diꝑerent regime types.
2. Without some speciꝑcation of war aims and mobilization costs, the last phrase of this statement allows anything with respect to democratic war behavior.
3. Benoit (1996) suggests that on average democracies are slightly less war prone than other systems.
4. Although democracies do not ight wars with one another they often become engaged in militarized disputes (Oneal and Russett 1997). See Senese (1997) for an alternative view point.
5. Earlier work demonstrates the endogenous relationship of institutions to foreign policy interests (Bueno de Mesquita and Siverson 1996; Schultz 1996; McGillivray 1997).
6. The theory we develop does not require that we assume minimal winning coalitions (Riker 1962). Indeed, the results generalize straightforwardly to any deꝑined magnitude for  $W$ . Having said that, it makes most sense to begin from a minimal winning context because that appears to be incentive compatible with the objective of leaders to maximize their gains. One of the central questions of interest to us here is how  $W$  is selected, including the selection of  $W$  such that it deviates from minimal winning. The comparative static analysis we undertake is, in part, focused on that question.
7. As Reiter and Stam (1998b) show, the level of these intangibles is correlated with regime type. For convenience, we normalize the uncertainty about each side's

intangibles and allow differences in expected levels to be part of the military balance term.

8. Other common examples used in international relations include Bueno de Mesquita, Morrow and Zorick (1997) who set  $\phi(\theta) = \begin{cases} < 0 & \text{if } \theta < 0 \\ 1 & \text{if } \theta \geq 0 \end{cases}$  and  $f(m_A; m_B; g_A; g_B) = m_A + 2(M - 1) m_B + g_A r_A + g_B r_B$  and the standard ratio of forces model (see for example Bueno de Mesquita 1981) which sets  $\phi(\theta) = \begin{cases} 0 & \text{if } \theta < 0 \\ \theta & \text{if } \theta \in [0; 1] \\ 1 & \text{if } \theta > 1 \end{cases}$  and  $f(m_A; m_B; g_A; g_B) = \frac{m_A + M + r g_A}{m_A + m_B + 1 + r g_A + r g_B}$ ; Hirshleifer (1989) examines the implications of variation in these functions.

9. There is, of course, a large literature on credible signaling of private information in crises and the difficulties this poses. See, for instance, Morrow (1989), Fearon (1994, 1995), Powell (1996), Smith (1998).
10. In autocracies and other non-democratic regimes, campaigns do not take the form of public debate over the issues of the day, but rather take forms like secret discussions to launch a coup d'etat, assassination, or other means to overthrow the incumbent. Success depends on attracting enough supporters to depose the sitting government and replace it with one led by the leader of the opposition effort. Even in the most autocratic regime there are always people eager to take over the role of leadership. Because of the risks associated with the effort (captured by our notion that the probability of being essential to a successor government is equal to  $\frac{W}{S}$ ), challengers in autocracies generally operate in secret. Yet, we would be mistaken to believe that challengers do not always exist. One obvious indication of their presence is that even following the sudden death of an incumbent there is never a problem in an autocracy in finding people willing

to step in and assume leadership. More often, many people compete for the opportunity to lead. In many systems, the closest supporters of the leader are the obvious candidates to be challengers.

11. We assume here that all members of society benefit equally from international outcomes. However, as earlier work shows (Bueno de Mesquita et al 1997), foreign policy objectives are a function of institutional arrangements. Countries with small winning coalitions typically fight for resources that can be targeted as private goods to the regime's supporters. By contrast, countries with large winning coalitions fight over policies that have larger public goods components.
12. Bueno de Mesquita and Siverson (1995) and King, Tomz and Wittenberg (1998) find empirical support for these predictions.
13. One might argue that the value of remaining in office,  $v$ , is a function of regime type. As Goemans (1995) points out, being ousted is more often fatal for autocrats than democrats. However, our assumption is that the primary goal of all leaders is to keep their jobs. Given this, the principle component in every leader's objective function is reselection.
14. While the model does not require this sharp a distinction, the complexity of the mathematics for the general solution does not alter or illuminate the salient results in this paper. Rather than burden the reader with unnecessary additional mathematics, then, we focus on the extreme cases to highlight the relevant results which hold in the general case as well.
15. Note that if leader A's probability of reselection is independent of her choices, then this equation reduces to  $p_A = \frac{R_A}{W_A}$ .
16. The model points to one exception. If the total resource pool falls below a theoretically determined threshold, then all incumbents, regardless of regime

type, allocate all resources to the provision of public goods. If near total destruction is anticipated in a war, then the model suggests that autocrats and democrats will make an all-out effort.

17. This follows because  $F^{\frac{1}{3}} + 1 + k + \frac{R_A}{W_A} + \frac{R_A}{S_A} > F^{-1} + k + \frac{R_A}{W_A} + \frac{R_A}{S_A}$  and  $F^{-1} + 1 + k + \frac{R_A}{S_A} > F^{-1} + k + \frac{R_A}{S_A}$ .

18. The comparison is made to  $p_A$  and not to  $p_A^0$  because we have shown that the democratic leader typically will try hard.

19. The model suggests that democracies are unattractive targets for democratic aggression. Yet, the model does not rule out war between democracies. Rather it states that war is less likely between democratic dyads than it is between other polity pairs.

20. In this case,  $\mu_B(m_B | WAR_B) = \frac{1}{1 + \overline{m}_B}$ . If no types of B want to attack then  $\overline{m}_B = 1$  and if all types want to fight then  $\overline{m}_B = 0$ .