Domestic Political Survival and International Conflict: Is Democracy Good for Peace?

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Very Preliminary

1 Introduction

The idea that bad systems of government is the cause of wars has a long history. In the eighteenth century, Thomas Paine argued that monarchs go to war to enrich themselves, but the population pays the cost. "What inducement has the farmer, while following the plough, to lay aside his peaceful pursuit, and go to war with the farmer of another country?" (Paine [16] p. 169). Immanuel Kant ([9]) agreed: "if the consent of the citizens is required in order to decide that war should be declared, nothing is more natural than that they would be very cautious in commencing such a poor game." Many expected that a better system of republican government would lead to lasting peace. However, as discussed by Kissinger [**?**], even in the eighteenth century this "democratic peace" idea was controversial, with Alexander Hamilton and others arguing against it. After all, weren't the Greek city states involved in many wars?

A large body of empirical work has investigated the democratic peace hypothesis, and many have elaborated on its subtleties. While democracies are as likely to be engaged in wars as non-democracies, they seem to rarely fight each other (Babst [1], Levy [10] and Maov and Russett [13]). Indeed, Levy [10] claims that "This absence of war between democracies comes as close as anything we have to an empirical law in international relations." This empirical regularity has captured the attention of commentators and policy-makers of all political persuasions. In his 1994 State of the Union address, President Clinton [5] used it to justify promoting democratization around the world. Currently, the idea of a democratic peace provides a key justification for the U.S. policy to "seek and support the growth of democratic movements and institutions in every nation and culture" (President Bush's second inaugural address). In a representative commentary, Kagan and Kristol ([8] p. 104) contend that the "strategic value of democracy is reflected in a truth of international politics: Democracies rarely, if ever, wage war against one another". On the other hand,

while many "neoconservatives" have taken up the banner of democratization, some "realists" argue that such a policy might do more harm than good. "I don't think in any reasonable time frame the objective of democratizing the Middle East can be successful. If you can do it, fine, but I don't think you can, and in the process if trying to do it, you can make the Middle East a lot worse." (Scowcroft [17]).

If wars are started by greedy leaders who care little about the suffering of their population, then the idea that democratization will promote peace does seem plausible. However, there is a different explanation for wars, which goes back to Thucydides's analysis of the Peloponessan war. According to Thucydides [19], wars can be due to mutual fear and distrust rather than greed. But this would imply a rather subtle relationship between democracy and peace. There seems to be no a priori reason why the population should be less fearful that their leader. Indeed, if the population pays the cost of a defensive war fought on their own territory, they may be quite attracted by the idea of a preemptive strike to eliminate the threat. And this logic might feed a spiral of fear and distrust among nations. In order to illuminate the underlying logic of conflict, and to inform policy, we need a deeper understanding of the relationship between political institutions and war in Thucydides's scenario.

In Baliga and Sjöström [2], we introduced a game theoretic arms-race model where conflict is caused by mutual fear. However, we assumed each country consists of a representative agent, in which case the idea of domestic politics has no meaning. In this paper, we will assume there is a heterogeneous population, so the political system can play a role in determining the probability of conflict. Specifically, we will assume that a leader can be removed from power if his popularity falls below a certain critical level. If this critical level is zero, then the leader is an autocrat or dictator who is never ousted. If the critical level is 50%, then the country is an "full democracy" where the leader needs the support of the median voter to stay in power. There are intermediate cases of "limited democracies" where the critical level of support lies strictly between 0 and 50%. (The literature uses the term *anocracy* to refer to a case which is intermediate between autocracy and full democracy.) In the limited democracy, the leader cannot completely disregard the opinions of his population. He will be ousted if things get sufficiently bad, but he does not necessarily need the support of the median voter. (We use the term "median voter" even when the regime is not a full democracy. It simply means the citizen whose "type" is the median type in his population.)

In each population there are "pacifistic types" who always want their own government to be peaceful (dovish), and "greedy types" who always want their own government to be aggressive (hawkish). However, the median voter sees the world as a stag-hunt game, where the best strategy depends on the attitude of the foreigners. If his country coexists peacefully with the foreign country, then the median voter supports his leader. However, he does not want his own leader to be a dove if the foreign leader is a hawk. Thus, the leader of the full democracy has an incentive to match the foreign leader's action. In a *limited* democracy, the leader also risks losing power if he is a dove while the

foreign leader is a hawk, since the worst possible outcome is to be dominated by foreigners. On the other hand, the leader of the limited democracy is less likely to be ousted if he is a hawk while the foreign leader is a dove, because this outcome is not as bad as the reverse situation. In other words, the logic of the stag-hunt game implies that in a limited democracy, the leader is more likely to be ousted if he behaves "too dovishly" than if he behaves "too hawkishly". This hawkish bias does not exist in autocracies or in full democracies. Thus, limited democracies are predicted to behave more aggressively than either autocracies or full democracies. In fact, the idea that the leader of a limited democracy worries about appearing weak in the eyes of his population seems intuitively plausible. There are many cases, such as Argentina after the Falklands war, where leaders who are not democratically elected are ousted after suffering losses at the hands of foreign powers.

Will an autocratic government be more or less aggressive than a full democracy? The answer turns out to depend on the environment. If foreign leaders are likely to be hawks, then the median voter wants his own leader to be a hawk. In this case, the leader of the full democracy will tend to be more hawkish than the leader of an autocracy (who, by definition, cares nothing about his citizens). Conversely, if foreign leaders are likely to be doves, then the autocratic leader will tend to be more hawkish then the leader of the full democracy. Hence, while *limited* democracy is always unambiguously bad for peace in our model, even the conversion of a dictatorship into a full democracy may reduce the chance of peace *if the median voter is sufficiently fearful*. Again, it is easy to think of real-world illustrations. The democratically elected Hamas might destabilize the Middle East, and the democratically elected George W. Bush has initiated major wars in Afghanistan and Iraq.

Our key prediction is that limited democracy is bad for peace. We test this prediction using the Correlates of War data on the incidence of conflict and the Polity data on regime types. (Versions of these two datasets have been used in most empirical work on the democratic peace hypothesis.) We primarily study military interstate disputes between directed dyads. Military interstate disputes include not only wars but also, for example, the firing of a missile. This maximizes the amount of data we have available. The directed dyad data splits countries into pairs and reports not only when a dyad is at conflict but also which country initiated the conflict. Most empirical studies study Polity scores of dyads and relate them to the probability a dyad is at war. They control for factors such as the level of trade, whether the countries are allies, whether they are major powers, how far apart they are etc. We use many of the same techniques, controls and datasets as the rest of the literature.

The main innovation in our empirical analysis is that we seek to test a non-monotonic relationship between the level of democracy and conflict. Hence, we adopt a non-parametric approach. Using the Polity indices, we divide countries into three groups: autocracies, limited democracies and full democracies. We then compare the probability of conflict between two limited democracies with all other regime pairs using conditional logit regressions. Between 1885 and 1992, dyads consisting of two limited democracies are indeed more likely to

experience a military interstate dispute than any other dyads, although some comparisons are not statistically significant at conventional levels. Dyads consisting of two democracies are less likely to experience a military interstate dispute than any other dyads (again, some comparisons are not statistically significant). The data thus provides support for the non-monotonicity hypothesis, as well as for the standard democratic peace hypothesis. We then split the data in two sub-samples, 1885-1945 and 1945-1992, and perform the same analysis. In the post-1945 data, we find little support both for the non-monotonicity and the democratic peace hypothesis, as most differences between limited democracies, democracies, and other regime types are statistically insignificant. However in the pre-1945 data, there is considerable support for non-monotonicity, but not much support for the democratic peace hypothesis. (We intend to perform various robustness checks on many dimensions.)

Some recent theoretical work has investigated the relationship between political systems and war. Jackson and Morelli [6] consider a model where the political leader's costs and benefits from a war may differ from the population at large. This model formalizes the intuition that countries go to war if their leaders preferences are sufficiently biased, i.e., different from the population at large. Two unbiased leaders would prefer to sign a peace treaty (the "unbiased peace"). Levy and Razin [11] study the willingness to make concessions under different political systems. In their model, an uninformed population is more likely than an informed autocrat to favor concessions when the net benefit to this is low. Their model predicts that the probability of peace is higher in a democratic dyad than in any other. Bueno de Mesquita et al. [3] allow a political leader to buy off key supporters in the event that their foreign policy fails. A dictator, who has to buy off fewer key supporters, is hence more likely to go to war than a democratically elected leader who faces rejection by the electorate should he fail. None of these models appear to predict a non-monotonic relationship between democracy and war.

The work most related to our's is the empirical work of Mansfield and Snyder [12]. They argue intuitively that countries may become a bigger threat to peace when they are recently democratized. If nationalism is important in a young democracy, conflicts with other countries may result. They find empirical support for their hypothesis by studying countries that make the transition from autocracy to limited democracy. Our theoretical model provides support for the idea that limited democracies, *young or old*, are more aggressive than autocracies. The data also seems to support our hypothesis. Future empirical work may distinguish our hypothesis from Mansfield and Snyder's.

2 The Theoretical Model

2.1 Basic Assumptions

There are two countries. Each country has a continuum of citizens. Each citizen is characterized by his type c, which is drawn from a distribution F with support

$[0, \bar{c}]$. Let c^{med} denote the median type, $F(c^{med}) = 1/2$. The distribution F is the same in both countries. We assume F is continuous, strictly increasing and concave. Each country has a leader, whose type is drawn from the same distribution F. The leader of country $i \in \{1, 2\}$ is called leader i.

The two leaders play a game which is similar to the arms race game of Baliga and Sjöström [2]. Each leader can choose a hawkish strategy (H) or a dovish strategy (D). To be a hawk, i.e., to choose H, means to behave aggressively. It may represent building new weapons, preparing for war, or attacking the other country. To be a dove, i.e. to choose D, is to be peaceful (i.e., do not build new weapons, prepare for war or attack). The payoff for a citizen of country i of type c is given by the following matrix, where the row represents the choice of leader i and the column represents the choice of leader j:

$$\begin{array}{cc} & \begin{array}{cc} H & D \end{array} \\ \begin{array}{c} H \\ D \end{array} & \begin{array}{cc} -c & \mu - c \\ -d & 0 \end{array} \end{array} \tag{1}$$

The parameter μ represents the gain a hawk can extract from a dove. For example, if the hawkish strategy is to attack, then μ represents the "first mover advantage", i.e., the gain from being on the offensive rather than on the defensive. (For a discussion of such first mover advantages, see...). The parameter d represents the loss a dove suffers at the hands of a hawk. For example, if the hawkish strategy is to attack, then d is the cost of being the defender. We assume

$$0 < \mu < c^{med} < d < \bar{c}. \tag{2}$$

A citizen of type c is a *greedy type* if $c < \mu$. For the greedy type, H is a dominant strategy, because $\mu - c > 0$ and $-c > -d$ (using 2). Therefore, he always wants his leader to be a hawk. In particular, the greedy type thinks taking advantage of a peaceful neighbor is a good thing (the best response to D is H). A citizen of type $c > \mu$ is not greedy: he thinks the best response to D is D. The fraction of citizens who are greedy is $F(\mu)$.

A citizen of type c is a *pacifistic type* if $c > d$. For the pacifistic type, D is a dominant strategy, because $-d > -c$ and $0 > \mu - c$ (using 2). Therefore, he wants his leader to be a dove, regardless of the actions of the leader of the other country. In particular, the pacifistic type thinks "appeasement" is a good approach (the best response to H is D). A citizen of type $c < d$ is not pacifistic: he thinks the best response to H is H. The fraction of citizens who are pacifistic is $1 - F(d)$.

Our assumption 2 implies that the median type is neither greedy nor a pacifist. From the median type's point of view, the game is similar to a stag-hunt game rather than a prisoner's dilemma. In a prisoner's dilemma, one action is dominant. But in the stag-hunt game, each player wants to match the action of the opponent. However, there is a pacifistic minority and a greedy minority, and these are dominant strategy types. The relative sizes of these minorities turn out to be crucial for our results. We believe the following assumption is reasonable.

Assumption 1. Greed is more prevalent than pacifism: $F(\mu) > 1 - F(d)$.

Consider the popularity of leader i among his population. The outcome of the game is denoted $x_i \in \{HH, HD, DH, DD\}$. Here $x_i = HD$ means leader i chooses H while the opponent (leader j) chooses D, etc. Let $\sigma_i(x_i)$ denote the fraction of the population of country i who support leader i's action. More briefly, $\sigma_i(x_i)$ is the *support* for the leader of country i. Since a fraction $F(\mu)$ thinks H is the best response to D, $\sigma_i(HD) = F(\mu)$. Similarly, $\sigma_i(DD) = 1 - F(\mu)$, $\sigma_i(DH) = 1 - F(d)$, and $\sigma_i(HH) = F(d)$. Assumption 1 implies

$$\sigma_i(DH) < \sigma_i(HD) < \sigma_i(DD) < \sigma_i(HH) \tag{3}$$

Thus, the popularity of leader i is maximized if he responds hawkishly to a hawkish opponent. It is minimized if he responds dovishly to a hawkish opponent (in which case only the small minority of pacifists support him). If he responds to a hawkish opponent by choosing D instead of H, then he suffers a net loss of support equal to $\sigma_i(HH) - \sigma_i(DH)$. On the other hand, if leader j is a dove, then if leader i responds by choosing H instead of D, he suffers a net loss of support equal to $\sigma_i(DD) - \sigma_i(HD)$. Assumption 1 is equivalent to

$$\sigma_i(HH) - \sigma_i(DH) > \sigma_i(DD) - \sigma_i(HD)$$

That is, taking the "wrong" action when the opponent is a hawk is more costly, in terms of popularity, than taking the "wrong" action when the opponent is a dove. This asymmetry is fundamental to our results.

We will assume there is σ_i^* such that the leader of country i needs the support of a at least a fraction σ_i^* of his population in order to stay in power. The value of staying in power is $R > 0$, which we refer to as the *rents from office*. This formulation covers a wide range of political systems (see Section 2.2). To simplify the exposition, we assume $R < \mu$. This guarantees that the most aggressive leader of type $c = 0$ prefers to choose H, even if by doing so he risks losing power. Removing this assumption will not change our main results, however, it would introduce the possibility of multiple equilibria, without adding any insights.

Each agent privately knows his own type (i.e., his c), but everything else is common knowledge. In particular, σ_1^* and σ_2^* are commonly known.

The time line is as follows.

Time 0: all citizens and both leaders privately observe their own types.

Time 1: the two leaders simultaneously choose either H or D.

Time 2: the leader of each country i is ousted if he is supported by less than a fraction σ_i^* of his population

2.2 Classification of Regimes

2.2.1 Autocracy

If $\sigma_i^* \leq 1 - F(d)$ then country i is an *autocracy*. In this case, $\sigma_i(x_i) \geq \sigma_i^*$ for all $x_i \in \{HH, HD, DH, DD\}$. If country i is an autocracy and leader i's type

is c, then his payoff matrix is given by (1). Indeed, there is no possibility that he may be ousted from power, so he cares only about his own cost and benefit. If leader j chooses H with probability p_j, then leader i prefers H if

$$-c + (1 - p_j)\mu \geq -dp_j$$

which is true if and only if $c \leq \mu + (d - \mu)\, p_j$. Therefore, the probability that leader i chooses H is $p_i = h(p_j, A)$, where

$$h(p_j, A) \equiv F\left(\mu + (d - \mu)\, p_j\right) \tag{4}$$

The function $h(\cdot, A)$ can be thought of as the best response function for the leader of an autocratic country (where the A stands for autocracy).

2.2.2 Ideal democracy

If $F(\mu) < \sigma_i^* < 1 - F(\mu)$ then country i is a *full democracy*. In this case,

$$\sigma_i(DH) < \sigma_i(HD) < \sigma_i^* < \sigma_i(DD) < \sigma_i(HH)$$

The leader of a full democracy can stay in power if and only if he takes the action which is best for the median voter. Thus, leader i gets R if and only if the outcome is HH or DD. If leader i's type is c, then his payoff matrix is

$$\begin{array}{cc} & \begin{array}{cc} H & D \end{array} \\ \begin{array}{c} H \\ D \end{array} & \begin{array}{cc} R - c & \mu - c \\ -d & R \end{array} \end{array}$$

If leader j chooses H with probability p_j, then leader i prefers H if

$$p_j R + (1 - p_j)\mu - c_i \geq -p_j d + (1 - p_j)R \tag{5}$$

which is true if and only if $c_i \leq (2R + d - \mu)\, p_j + \mu - R$. Therefore, the probability that leader i chooses H is $p_i = h(p_j, I)$, where

$$h(p_j, I) \equiv F\left((2R + d - \mu)\, p_j + \mu - R\right) \tag{6}$$

This is the best response function for the leader of a full democracy.

2.2.3 Limited democracy

If $1 - F(d) < \sigma_i^* < F(\mu)$ then country i is a *limited democracy*. In this case,

$$\sigma_i(DH) < \sigma_i^* < \sigma_i(HD) < \sigma_i(DD) < \sigma_i(HH)$$

The leader of the limited democracy remains in power in all cases except if he responds to H by choosing D. If the leader's type is c, then his payoff matrix is

$$\begin{array}{cc} & \begin{array}{cc} H & D \end{array} \\ \begin{array}{c} H \\ D \end{array} & \begin{array}{cc} R - c & R + \mu - c \\ -d & R \end{array} \end{array} \tag{7}$$

He prefers H if

$$R - c_i + (1 - p_j)\mu \geq -p_j d + (1 - p_j)R$$

which is true if and only if $c_i \leq \mu + p_j (d + R - \mu)$. Therefore, the probability that the leader of country i chooses H is $p_i = h(p_j, L)$, where

$$h(p_j, L) \equiv F(\mu + p_j (d + R - \mu)) \tag{8}$$

This is the best response function for the leader of a limited democracy.

2.2.4 Other possibilities

There are some uninteresting cases in addition to the three interesting cases already mentioned. If $1 - F(\mu) < \sigma_i^* \leq F(d)$ then leader i is a *weak leader*. In this case,

$$\sigma_i(DH) < \sigma_i(HD) < \sigma_i(DD) < \sigma_i^* < \sigma_i(HH)$$

The weak leader is ousted in all cases except when the outcome is HH. Therefore, his payoff matrix is

$$\begin{array}{ccc} & H & D \\ H & R - c & \mu - c \\ D & -d & 0 \end{array} \tag{9}$$

But this payoff matrix is strategically equivalent to the matrix (7). Therefore, the probability that leader i chooses H is again given by (8).

Similarly, if $\sigma_i^* > F(d)$, then leader i is a *lame duck*: he is ousted no matter what he does (his support is never greater than $\sigma_i(HH) = F(d)$). The lame duck has no reason to care about his citizens' preferences, so this case is strategically equivalent to the autocratic case.

3 Equilibrium

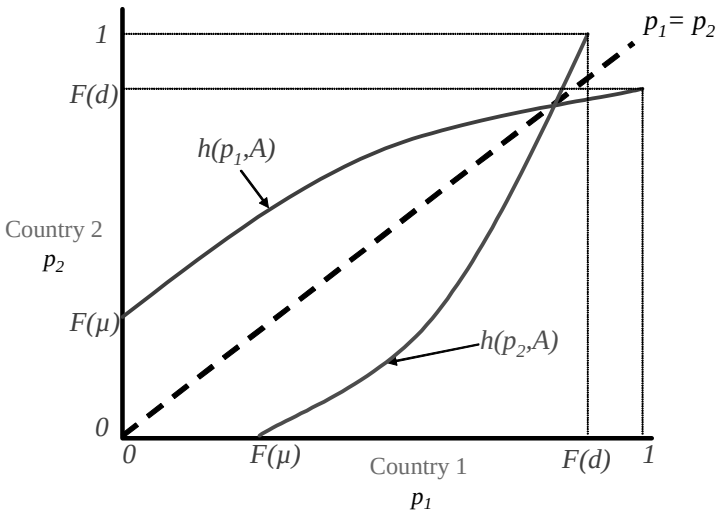
Let country i's regime type be denoted $T_i \in \{A, I, L\}$, corresponding to autocracy, full democracy, and limited democracy. Each player's strategy may be considered to be the probability of playing H. The equilibrium is found by solving the two best response equations simultaneously:

$$p_1 = h(p_2, T_1)$$

$$p_2 = h(p_1, T_2)$$

These two curves can be drawn in (p_1, p_2) space, as in Figure 1 which is drawn for the case of two autocracies:

Figure 1: Two Autocracies



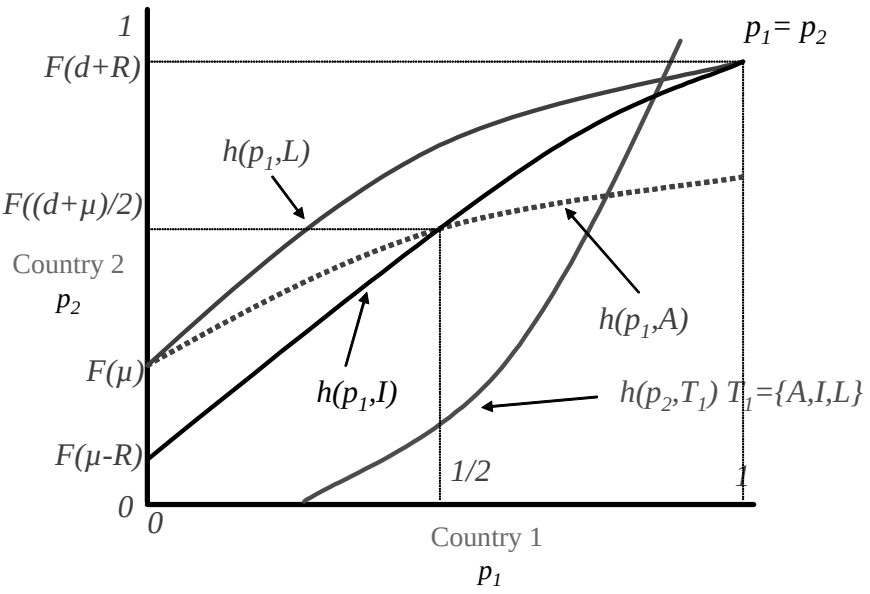
The best response functions are strictly increasing and concave. The game is therefore one of strategic complements (each leader is more likely to choose H, the more likely he thinks it is that the opponent chooses H). Since the players have single-dimensional strategy sets, the game is supermodular. It is easy to check that, whatever the regime types of the two players, there is always a unique equilibrium.

The equilibrium can be reached via the iterated deletion of dominated strategies (cf. Milgrom and Roberts **??**). The argument is similar to Schelling's [18] famous discussion of reciprocal fear of surprise attack. Some types of leaders have a dominant strategy to play H, and they must certainly play H in equilibrium. Therefore, types with an "almost dominant strategy" to play H must also play H, as they must put positive probability on the other leader choosing H. The process continues with more and more types choosing H. But if dominant strategy pacifist types are present, a similar spiral can develop on the dovish strategy too. These two processes pin down the equilibrium and the cut-off type of leader who is indifferent between H and D.

3.1 The inverse U

It is easy to check that $h(p, L) > h(p, A)$ and $h(p, L) > h(p, I)$ for all $p \in (0, 1)$. That is, for any given p_j, leader i responds more hawkishly if country i is a limited democracy than if it is either an autocracy or a full democracy. The reason is that the leader of the limited democracy is highly motivated to avoid the worst possible outcome, DH. Of course, in equilibrium p_j will not be independent of the regime in country i. However, by strategic complements, the fact that the limited democracy is very hawkish will cause the opponent to increase p_j, which in turn will cause leader i to become even more hawkish:

Figure 2: Autocracy vs. Ideal or Limited Democracy



Therefore, the model makes the unambiguous prediction that limited democracies are strictly worse for peace than either autocracies or full democracies. Formally, replacing any regime type with a limited democracy will increase the equilibrium values of both p_1 and p_2.

3.2 Autocracies versus full democracies

It can be checked that $h(p, I)$ and $h(p, A)$ have a unique intersection at $p = 1/2$. If $p > 1/2$ then $h(p, I) > h(p, A)$. Thus, when facing an opponent who is likely to be a hawk, the leader of the full democracy responds more hawkishly

than the autocrat. The reason is that public opinion supports hawkish actions against hawkish opponents. However, if $p < 1/2$ then $h(p, I) < h(p, A)$. Thus, when facing an opponent who is more likely to be a dove, the leader of the full democracy responds less hawkishly than the autocrat. The reason is that public opinion supports dovish actions when the opponent is a dove.

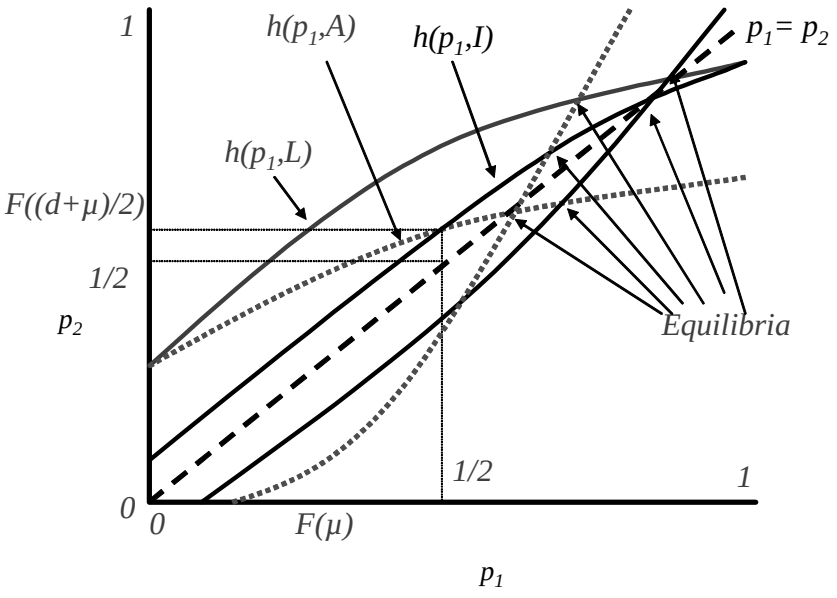
Since the two best response curves intersect, it cannot be determined a priori whether a full democracy be more or less hawkish than an autocratic regime. It depends on the equilibrium probability that the opponent is a hawk.

Case I: $c^{med} < (d + \mu)/2$. In this case the median type has a low c, i.e., he is fairly hawkish. This generates a high equilibrium risk of conflict. In case I, the intersection of $h(p, I)$ and $h(p, D)$ lies above the 45% line, because

$$h\left(\frac{1}{2}, A\right) = h\left(\frac{1}{2}, I\right) = F\left(\frac{d+\mu}{2}\right) > F\left(c^{med}\right) = \frac{1}{2}$$

In this case, it can be verified diagrammatically that *regardless of regime types,* in equilibrium each leader chooses H with a probability greater than one half:

Figure 3: Case 1



But for any $p \in (1/2, 1)$, we have $h(p, L) > h(p, I) > h(p, A)$. Therefore, in case I the model produces a definite ranking of the three regime types: the limited democracy will be most hawkish and the autocracy most dovish. Formally,

regardless of which regime types are interacting, replacing an autocracy with a full democracy, or a full democracy with a limited democracy, will increase the equilibrium values of both p_1 and p_2. These observations lead to the following ranking of the probability of conflict for the "row" country as a function of dyadic pairs of interactions (with 1 as the highest and 9 the lowest):

	A	L	I
A	$9,9$	$7,3$	$8,6$
L	$3,7$	$1,1$	$2,4$
I	$6,8$	$4,2$	$5,5$

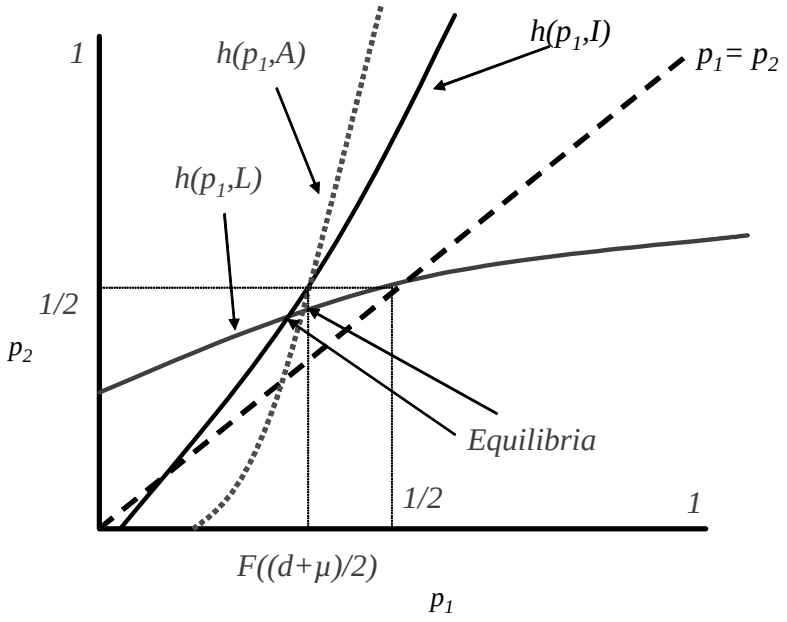
Case II: $c^{med} > (d+\mu)/2$. In this case the median type has a high c, i.e., he is fairly dovish. This generates a low equilibrium risk of conflict. In case II, the intersection of $h(p,I)$ and $h(p,A)$ lies below the 45% line. It can verified that as long as neither country is a limited democracy, in equilibrium each leader chooses H with a probability less than one half. But $p < 1/2$ we have $h(p,I) < h(p,A)$. Therefore, in interactions that do not involve limited democracies, the autocratic leader behaves more hawkishly than the leader of a full democracy. However, in interactions that involve limited democracies, there are two possibilities.

Case IIA:

$$c^{med} > \left(1 - F\left(\frac{d+\mu}{2}\right)\right)\mu + F\left(\frac{d+\mu}{2}\right)(d+R) \tag{10}$$

In this case, the median type is very dovish. It can be checked that (10) implies $h\left(F\left(\frac{d+\mu}{2}\right), L\right) < 1/2$. It can be checked diagrammatically that if one country is a limited democracy and the other either an autocracy or a full democracy, then in equilibrium each leader chooses H with probability less than $1/2$:

Figure 4: Case IIA



But for $p < 1/2$ we have $h(p, I) < h(p, A)$. Therefore, in interactions that involve limited democracies, the autocracy is more hawkish than the full democracy. But we also know that the autocracy is more hawkish than the full democracy in in interactions that do not involve limited democracies. Therefore, autocracies are more hawkish than full democracies in all interactions. In case IIA, interactions between full democracies and limited democracies are relatively peaceful, because the median type is fairly peaceful. Interactions between autocracies and limited democracies are less peaceful, because the autocratic leader does not care about the median type's preferences. In case IIA, in any dyadic pair, replacing a full democracy with an autocracy, or a full democracy with a limited democracy, will always increase the equilibrium values of both p_1 and p_2. These observations lead to the following ranking of the probability of conflict for the "row" country as a function of dyadic pairs of interactions (with 1 as the highest and 9 the lowest):

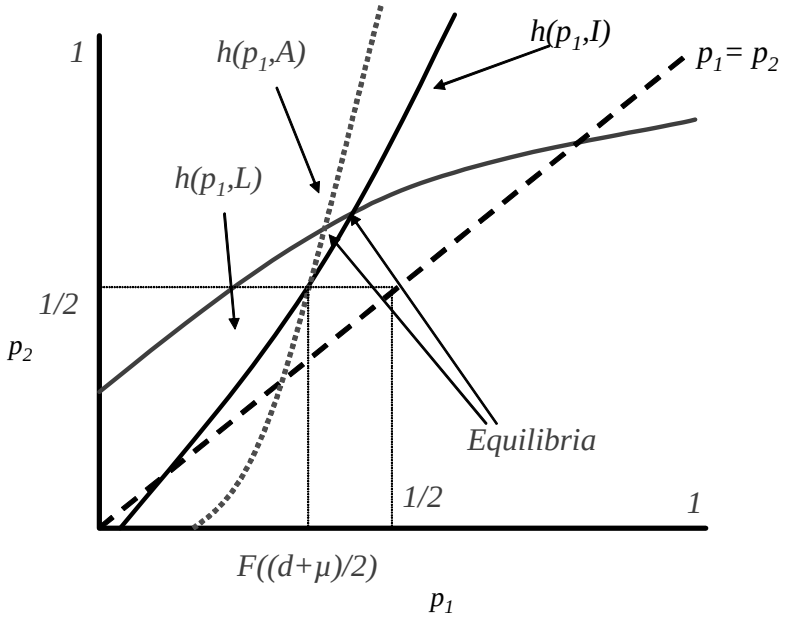
	A	L	I
A	$5, 5$	$4, 2$	$6, 8$
L	$2, 4$	$1, 1$	$3, 7$
I	$8, 6$	$7, 3$	$9, 9$

Case IIB:

$$c^{med} < \left(1 - F\left(\frac{d+\mu}{2}\right)\right)\mu + F\left(\frac{d+\mu}{2}\right)(d+R) \tag{11}$$

This is an intermediate case: the median type is more hawkish than in case IIA, although still less hawkish that in case I. It can be checked that (11) implies $h\left(F\left(\frac{d+\mu}{2}\right), L\right) > 1/2$. It can be checked diagrammatically that if one country is a limited democracy and the other either an autocracy or a full democracy, then in equilibrium each leader chooses H with probability greater than $1/2$:

Figure 5: Case IIB



But for $p > 1/2$ we have $h(p, I) > h(p, A)$. Therefore, in interactions that involve limited democracies, the full democracy is more hawkish than the autocracy. But we already know (since we are in case II) that the autocracy is more hawkish than the full democracy in interactions that do not involve limited democracies. Therefore, whether full democracies on average are more or less hawkish than autocracies depends on how many limited democracies exist in the population. In case IIA, interactions between full democracies and limited democracies are not so peaceful, because the median type is fairly aggressive. Interactions between autocracies and limited democracies are more peaceful, because the autocratic leader does not care about the median type's preferences.

These observations lead to the following ranking of the probability of conflict for the "row" country as a function of dyadic pairs of interactions (with 1 as the highest and 9 the lowest):

	A	L	I
A	$6,6$	$5,3$	$7,8$
L	$3,5$	$1,1$	$2,4$
I	$8,7$	$4,2$	$9,9$

4 Empirical Predictions

Prediction 1. Limited democracies are more aggressive than both autocracies and full democracies.

Thus, the model predicts an inverse U shaped relationship between degree of democracy and number of conflicts.

Turning to the comparison between full democracies and autocracies, we find that in case I above, where the probability of conflict is high, the full democracy is more aggressive. In case IIA, the probability of conflict is very low, and the autocracy is more aggressive. Case IIB is an intermediate case, where the relative level of aggression is determined by the kind of regime types countries interact with. This generates the following prediction.

Prediction 2. As the probability of conflict increases, full democracies become relatively more aggressive than autocracies.

So far, we have discussed the effect of regime type on the probability of conflict. However, a modification of the model generates another set of predictions. Countries that are classified as fully democratic may behave quite differently from each other. Consider a democratic state where the leader is elected using majority rule. Suppose there are two kinds of citizens: *ideological voters* and *swing voters*. The ideological voters make up a fraction α_i of the population in country i. A fraction γ_i of the ideological citizens always vote for the incumbent, and a fraction $1-\gamma_i$ always vote for a challenger. The swing voters, however, vote for the incumbent if and only if they agree with his actions in the arms race game. The incumbent wins the election if and only if he gets the support of at least a fraction σ_i^* of the swing voters, where σ_i^* satisfies

$$\alpha_i\gamma_i + (1-\alpha_i)\sigma_i^* = \frac{1}{2}$$

That is,

$$\sigma_i^* = \frac{\frac{1}{2} - \alpha_i\gamma_i}{1-\alpha_i}$$

as long as $\alpha_i\gamma_i < 1/2$. In this scenario, the threshold level of support σ_i^* can be derived from the fundamental parameters γ_i and α_i. If the incumbent is entrenched, then γ_i and α_i are high, so σ_i^* is low. Such a nation will be expected

to have the same government in power for a long time. Thus, the rate of turnover may be used as a proxy for σ_i^*. The behavior of a government with a high rate of turnover would be expected to be that of a country with a high σ_i^*, as discussed above. The relationship between rate of turnover and rate of conflict would be, according to the model, non-monotonic.

5 Empirical Analysis

5.1 Data

This section describes the data and sources used in the empirical analysis. Data on inter-state conflict are from the Correlates of War (COW) project. The dataset is an unbalanced panel indexed by a country $i = 1, ..., N$ (approximately 190 countries) and a year $t = 1885, ..., 1992$. Three forms of conflict data have been considered in the democratic peace literature: monadic and dyadic, either directed or undirected. The unit of observation is a country-year in the monadic data, while it is a country pair-year in the undirected dyads. The directed dyadic data also record the direction of the conflict (which country took the first action) and so there are two observations for each dyad.[1] The original COW data are in monadic form, and forming the dyadic data often requires additional information than reported in the original COW dataset (e.g.: information on the state forming specific coalitions during multilateral conflicts). Zeev Maoz has augmented the standard monadic COW dataset and constructed a dyadic dataset which we utilize.

Data on regime characteristics are from the Polity III dataset (Jaggers and Gurr [7]). Indexes measuring the competitiveness of political participation, the competitiveness of the process for selecting the chief executive, and many other characteristics are used to construct democracy and autocracy scores ranging from 0 to 10 for each regime. Oneal and Russett [15] and many others combine these two scores into one by taking the difference of the democracy and the autocracy index and use this aggregate score (*net democracy*) to rank countries as autocracies, limited democracies or democracies.

The COW data and the Polity data, along with trade and other controls considered in the democratic peace literature, are available from Scott Bennett's EUgene website at Penn State or through datasets from Bruce Russett's webpage at Yale..

5.2 Empirical Model

Our empirical strategy has two steps. We first utilize the Polity *net democracy* index to construct a set of dummy variables that measure the regime types of the two countries of each dyad. We then study the impact of regime type pairs on the probability of militarized dispute (MID) by running panel logit regression

[1] Thus, twice the amount of country pairs are recorded in the directed relative to the undirected data. In undirected data there are at most $\binom{N}{2}$ possible pairs per year.

models with fixed effects that include these dummy variables, along with other controls usually considered in the democratic peace literature. This simple methodology allows us to study the effects of democracy on conflict without imposing any initial parametric restriction.[2]

The *net democracy* index from Polity III ranges from -10 to 10, thus taking 21 possible values. In the baseline model, we divide the range of 21 possible *net democracy* values, in three subintervals of equal length. An autocracy corresponds to values smaller than -3, an anocracy to values between -3 and 3, and a democracy to values greater than 3. We also consider an alternative classification where anocracies correspond to values of *net democracy* between -6 and 6, and autocracies and democracies are defined accordingly. Since each dyad records the regime type of each (potential or actual) MID initiator and target there are nine possible regime pairs for each dyad. As shown in Figure 6, we define a set of nine dummy variables, D_j's. Each dummy variable is equal to one when the regime type of the dyad corresponds to the pair of interest, and it is zero otherwise.

	Autocracy Dem_2: [-10,-4]	Anocracy Dem_2: [-3,3]	Democracy Dem_2: [4,10]
Autocracy Dem_1: [-10,-4]	D_{11}	D_{12}	D_{13}
Anocracy Dem_1: [-3,3]	D_{21}	D_{22}	D_{23}
Democracy Dem_1: [4,10]	D_{31}	D_{32}	D_{33}

Notes: Initiator of MID in rows, target of MID in columns

Figure 6: Dummy Variables

Using a fixed effect logit model, we attempt to explain the response probability of initiating a MID within each directed dyad

$$\text{Prob}\{MID_{it} = 1 | \{D_{j,it}\}_{j \in J},\ \mathbf{X}_{it}, c_i\} = G\left(c_i + \beta' \mathbf{X}_{it} + \sum_{j \in J} \gamma_j D_{j,it} \right),$$

for different values of the vector of controls $\mathbf{X}_{it}$ and dummy variables $\{D_{j,it}\}_{j \in J}$. To reduce issues of reverse causality, all right hand side variables are lagged by one year. The variable c_i is a fixed effect defined at the directed dyad level, which accounts for unobserved heterogeneity in the cross-section of directed dyads.[3] The entire set of dummy variables cannot be separately identified from the

[2] The only restriction imposed by the methodology, is the initial classification of regimes into autocracies, anocracies (limited democracies) and democracies (ideal democracies) starting from the *net democracy* index of Polity III as described below.

[3] The function $G(z) \equiv \exp(z)/(1 + \exp(z))$ is the c.d.f of the logistic distribution function.

constant term, and thus one variable is excluded from the estimation procedure. We choose to exclude the dummy D_{22}, so that the estimated coefficients on the remaining dummies $\{D_{j,it}\}_{j\in J}$ order the partial effects of each regime pair relative to the two anocracy pair. More precisely, the partial effect of regime j relative to the two anocracy pair is: $G\left(c_i + \hat{\beta}'_{it}\mathbf{X}_{it} + \hat{\gamma}_j\right) - G\left(c_i + \hat{\beta}'_{it}\mathbf{X}_{it}\right)$, where hatted variables denote estimated parameters. Since the fixed effects c_i are not estimated in conditional maximum likelihood estimation procedure, the estimated coefficients $\hat{\gamma}_j$'s only allow to order the impact of different regime types relative to the pair of anocracies. The main prediction of our theory is that two pairs of anocracies are the most likely to enter in a militarized dispute, so that all the estimated parameters $\hat{\gamma}'_j s$ should be negative. We are also interested in testing the theory of democratic peace, which states that pairs of democracies are the least likely to enter into conflict. Although the democratic peace hypothesis is an interesting benchmark for our theory, the two are not mutually exclusive as discussed in Section 3 (Case IIa and IIb). The ordering of partial effects relative to the pair of two democracies is simply obtained from the magnitude of the estimated coefficients. We further test the hypothesis that each γ_j for $j \neq \{33\}$ is different than γ_{33} with a Wald test for each restriction in turn.

The set of additional controls include six variables, along with decade fixed effects and cubic spline terms to capture temporal dependence of MID's initiation from the occurrence of MID's in previous years for the same directed dyad.[4] The six additional controls used in the empirical model are: 1) MinDep=min$\{$trade$_1$, trade$_2\}$ =trade$_k$ where trade$_k$ is the dyadic trade flows over country k's GDP (Oneal and Russett [15]), 2) MajPower$_t$: dummy variable equal to one if at least one of the two countries is a major power at t, 3) allies: dummy variable which is one if there is a treaty (nonaggression, neutrality) between the two countries, 4) LogCapRatio: is the log of the maximum to the minimum level of military capabilities (Oneal and Russett [15]), 5) Contig.: dummy variable which is one if the two countries share borders, 6) SystSize$_t$ number of countries at date t.

5.3 Empirical Results

The results of the empirical analysis are reported in the Table below. We consider five regression models which are all reported in the Table. For each regression model, Panel a) has two columns. The estimated coefficients and relative standard errors of the eight dummies measuring regime types of the (potential and actual) initiator and target of each dyad are reported in the first column. The second column reports the P-value of the Wald test for equality of each D_j's

For a review of qualitative response models and their panel specifications see chapter 15 of [20].

[4] Formal tests supported the use of both decade fixed effects and spline terms. The decade specification is adopted over a year fixed effect one because of the large number of years in the sample. The spline terms capture the fact that the probability of a MID is higher when another occurred in the past within the dyad (see Beck, Katz and Tucker [**?**]).

coefficient and that of D_{33} (a pair of two democracies).[5] Panel b) reports the coefficient and standard errors on the additional controls included in the regression models, with the exclusion of the decade fixed effects and the cubic spline terms. Model (1) is our baseline specification. With the exception of model (4) all models are panel logit models with fixed effects defined at the directed dyad level. Model (4) is a pooled model without fixed effects, and thus differs from the remaining models in that it considers both within and between variation of the directed dyads.[6] Model (2) and (3) split the sample of observations used in Model (1) in post and pre-World War II data. Finally in constructing the D_j's, Model (5) uses the alternative classification of regime types where anocracies correspond to values of *net democracy* between -6 and 6, and autocracies and democracies are defined accordingly.

	Dependent Variable: Initiation of a MID									
Model	(1)		(2)		(3)		(4)		(5)	
Panel a)										
D_{11}	-0.36		-0.20		-0.87		-0.99		0.02	
	[.34]	(<.01)***	[.61]	(.03)**	[.42]**	(.72)	(.21)***	(.05)**	[.22]	(<.01)***
D_{12}	-0.55		-0.38		-0.71		-0.82		-0.26	
	[.36]	(.03)**	[.64]	(.23)	[.43]*	(.55)	(.25)***	(.02)**	[.20]	(.02)**
D_{13}	-0.45		-0.54		0.29		-0.40		-0.13	
	[.33]	(<.01)***	[.63]	(.22)	[.41]	(.02)**	(.21)*	(<.01)***	[.28]	(<.01)***
D_{21}	-0.78		-1.30		-0.98		-0.91		-0.16	
	[.42]*	(.22)	[.65]**	(.37)	[.47]**	(.88)	(.34)***	(.14)	[.20]	(<.01)***
D_{23}	-0.53		-0.40		-0.16		-0.48		-0.32	
	[.36]	(.02)**	[.68]	(.19)	[.41]	(.11)	[.26]*	(<.01)***	[.26]	(<.01)***
D_{31}	-0.93		-0.67		-1.95		-0.68		-0.68	
	[.35]***	(.13)	[.63]	(.43)	[.57]***	(.14)	[.22]***	(<.01)***	[.34]**	(.15)
D_{32}	-0.69		-0.45		-1.39		-0.54		-0.62	
	[.35]**	(.02)**	[.65]	(.16)	[.63]**	(.64)	[.22]***	(<.01)***	[.30]**	(.05)*
D_{33}	-1.27		-0.89		-1.08		-1.45		-1.09	
	[.34]***		[.67]		[.55]**		[.27]***		[.33]***	
Panel b)										
MinDep	10.14		45.62		5.06		-40.30		13.51	
	[14.6]		[28.54]		[22.85]		[12.25]***		[14.84]	
MajPower	0.52		-11.28		-0.74		2.02		0.59	
	[.46]		[.57]***		[.52]		[.15]***		[.45]	
LogCapRatio	0.06		-0.08		0.01		-0.20		0.06	
	[.12]		[.19]		[.24]		[.04]***		[.12]	
Contig.	1.36		3.16		1.00		2.82		1.50	
	[.76]*		[1.12]***		[1.07]		[.20]***		[.71]**	
Alliance	-0.46		-0.29		-0.71		0.07		-0.55	
	[.16]***		[.30]		[.26]***		[.14]		[.16]***	
SystSize	-0.33		0.02		-11.82		-1.42		-0.25	
	[.48]		[.50]		[3.87]***		[.48]***		[.49]	
Estimator	CLOGIT		CLOGIT		CLOGIT		LOGIT		CLOGIT	
Years	1885-1992		1946-1992		1885-1945		1885-1992		1885-1992	
Observations	19703		10756		4496		616390		19703	
pseudo-R2	.04		.03		.11		.33		.04	

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Robust standard errors in brackets below each coefficient. P-value of Wald test for equality between each coefficient and the coefficient of D33 is reported in parenthesis next to the corresponding standard error. Models (1)-(3) and (5) are conditional logit models with fixed effects defined at the directed dyad level. Model (4) is a pooled logit model with standard errors clustered at the directed dyad-level. Model (5) differs from (1) in the definition of the dummy variables: values of the Polity III net democracy index of [-6,6] are coded as anocracies values of [-10,-7] as autocracies and of [7,10] as democracies. Each regression model includes (coefficient not reported) decade fixed effects and cubic spline terms to account for temporal dependence of the MIDs (see Beck, Katz and Tucker(1998)). Model (4) also includes the log-distance between each dyad's state capitals which is constant within each dyad(coefficient not reported).

We now analyze the empirical results by discussing the signs, ordering and significance of the coefficient on the dummy variables. As discussed above,

[5] The t-test (first column) on D_{33} is asymptotically equivalent to the analogous Wald test, and thus is not reported in the Table.

[6] Model (4) also includes the log-distance of each dyad's state capital (the coefficient is not reported in the table). This control is not included in the remaining specifications due to the lack of the variable's within dyad variation.

since the fixed effects are not being estimated, only the signs and order of the partial effects of each regime type are pinned down by our estimates, not their magnitudes.

First consider Model (1). As predicted by our theory all estimated coefficients are negative, so a dyad of two anocracies is the most prone to engage in a MID. For half of the regime types, the difference is statistically significant at conventional levels. The coefficient on D_{33} is also the smallest in Panel a), and a pair of democracies is the most peaceful as predicted by the democratic peace hypothesis (five comparisons are statistically significant).

When we split the sample in pre and post-World War II we find weaker support for our results post-World War II. For the democratic peace hypothesis, there is weak support both pre- and post-World War II. In Model (2), post-World War II, although all estimates in Panel a) are negative only one comparison is significant. This is also true for the second column and hence the democratic peace hypothesis also only gets weak support. In Model (3), pre-World War II, the non-monotonicity assumption finds as much as support as in Model (1), as all the estimated coefficients are negative and five of the comparisons are significant. On the other hand, we find only weak support for the democratic peace hypothesis as only two of the comparisons with D_{33} are significant, and the estimated coefficient on D_{33} is only the third smallest. Strong support is found in Model (4) for both theories as all the estimates have the predicted signs and orders in Panel a) and all comparisons are statistically significant. Finally Model (5) broadly confirms the results obtained in Model (1) for both hypotheses.

Overall we find that for the majority of estimated coefficients in Panel a), orderings and signs correspond to the hypothesis of a non-monotonic relation between democracy and conflict, with pairs of anocracies being the most prone to conflict as predicted by our model. Across the different models, roughly half of the comparisons between anocracies and other regime types are also statistically significant at conventional levels. Similarly, we find support for the democratic peace hypothesis (pairs of democracies are the most peaceful), although the democratic peace hypothesis does not find much support pre-World-War II, while the non-monotonicity assumption does.

Although still preliminary, these results provide support for our model and are novel as the vast majority of the empirical literature in international relations has only considered linear relations between regime types and conflict. We will shortly conduct additional robustness tests on these predictions and possibly estimate parametric models that account for non-monotonic and concave links between democracy and conflict.

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