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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 cause war 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 [17] 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 align the incentives of leaders with the preferences of the population and lead to lasting peace. However, even in the eighteenth century this "democratic peace" idea was controversial, with Alexander Hamilton and others arguing against it (Kissinger [10], p. 33). 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 [11] and Maov and Russett [14]). Levy [11] 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 [18]).

If wars are started by greedy leaders who care little about the suffering of their population, then the idea that democratization will promote peace seems plausible. However, there exists a different explanation for why states go to war. Thucydides [20] argued that the Peloponessan war was caused by "the growth of Athenian power and the fear which this caused in Sparta".[1] Sparta initiated conflict not because its leaders were greedy but because they feared Athens. Thus, mutual fear and distrust can cause wars, even if everyone hopes for peace. We refer to this as Schelling's dilemma, after the pioneering analysis of Schelling [19]. Schelling's dilemma implies 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 attracted by the idea of a preemptive strike to eliminate the threat. This spiral of fear and distrust could make democracies very aggressive when facing an opponent who is perceived as threatening.

In order to illuminate the logic of Schelling's dilemma, and to inform policy, we need a deeper understanding of the relationship between political institutions and war. We study this relationship in a model where both greed and mutual fear can trigger conflict. There are two countries, each with a heterogeneous population. Whether the leader of a country can stay in power depends on three factors: the preferences of his citizens, the political system, and the outcome of the interaction between the two countries. At one extreme of the political spectrum, "pacifistic" citizens always want their leader to be peaceful (dovish). At the opposite extreme, "greedy" citizens always want their leader to be aggressive (hawkish). We make the plausible assumption that there are more greedy types that pacifist types. The median voter is neither greedy nor pacifistic. He is an intermediate type who wants his leader to be hawkish if and only if the foreign leader is hawkish. If both countries coexist peacefully, then the median voter supports his leader. However, if the median voter thinks that the foreign leader is an aggressive hawk, then he wants his own leader to respond in kind. Thus, the median voter may support aggression out of fear, but not out of greed.

[1] A famous passage describes how the Spartans are spurred on by the Corinthians: "You Spartans are the only people in Hellas who wait calmly on events, relying on your defense not on action but on making people think you will act. You alone do nothing in the early stages to prevent an enemy's expansion; you wait till the enemy has doubled his strength. Certainly you used to have the reputation of being safe and sure enough; now one wonders if this reputation was deserved.....The Athenians...live close to you, yet you still do not appear to notice them; instead of going out to meet them, you prefer to stand still and wait till you are attacked, thus hazarding everything by fighting with opponents who have grown far stronger than they were originally" (Thucydides (1972, Book I, 69)).

Each leader derives a private cost and benefit from a conflict, but he also values staying in power. Following de Mesquita et. al. (1999), each political system is characterized by a *critical level of support* that a leader needs to stay in power. Our assumptions imply that there are three kinds of regimes. If the leader can never lose power, then the country is an *autocracy*. If the leader needs the support of the median voter to stay in power then the country is a *full democracy*. Finally, there is an intermediate type of regime. Since there are fewer pacifistic than greedy types, there are intermediate critical support levels such that the leader can stay in power if he has the support of those citizens who are greedy, but not if he is supported only by pacifistic types. We call such countries *limited democracies* (or *anocracies*). In a limited democracy, the leader cannot dismiss his citizens' opinions as easily as an autocratic leader can, 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.) If the leader of a limited democracy is more dovish than his opponent, then only his pacifistic citizens support him, so he loses power. However, he stays in power if he is more hawkish than his opponent, because in this case he has the support of the greedy types. This *hawkish bias* does not exist in autocracies, where the citizens' opinions don't matter, or in full democracies, where the leader answers to the median voter (who by assumption is not greedy). Thus, our first key prediction is that limited democracies will 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 were not democratically elected were still not "autocratic enough" to survive after their country had been humiliated by a foreign power.

Whether an autocratic government is more or less aggressive than a full democracy depends on the environment. If foreign leaders are likely to be hawks, then the median voter wants his own leader to be a hawk, and the leader of the full democracy will tend to be *more* hawkish than the autocrat (who, by definition, cares nothing about his citizens). But if foreign leaders are likely to be doves, then we obtain the usual democratic peace intuition, i.e., the fully democratic country will tend to behave more dovishly. Hence, while limited democracy is always unambiguously bad for peace, even the conversion of a dictatorship into a full democracy may reduce the chance of peace *if the median voter is sufficiently fearful*. Indeed, the democratically elected Hamas might destabilize the Middle East, and the democratically elected George W. Bush initiated a major conflict in 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 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 use Polity scores of dyads, and relate them to the probability a dyad is at war.

We adopt a non-parametric approach to test for a non-monotonic (inverted U-shape) relationship between the level of democracy and conflict. 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. A fixed effect defined at the directed dyad level accounts for unobserved heterogeneity. We also follow the empirical literature and control for factors such as bilateral trade, whether the countries are allies, the imbalance in their military capabilities, whether they are major powers, how far apart they are etc. To reduce issues of reverse causality, all right hand side variables are lagged by one year.

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. 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 [12] 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 Sny-

der [13]. 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, $i \in \{1, 2\}$. Each country i has a leader, leader i, and a continuum of citizens. The two leaders play a game which is similar to the arms race game of Baliga and Sjöström [2]. Each leader can choose an aggressive *hawkish* strategy (H) or a peaceful *dovish* strategy (D). The hawkish strategy may represent building new weapons, preparing for war, or attacking the other country. The dovish strategy implies refraining from such activities. Each citizen has a *cost type*, a cost of aggression c, which is drawn from a distribution F with support $[0, \bar{c}]$. The *median citizen*'s cost type is denoted c^{med}, i.e., $F(c^{med}) = 1/2$. To focus on the link between political institutions and conflict, we assume there is no innate difference between the two countries, so the distribution F is the same in both. We assume F is continuous, strictly increasing and concave. Each leader also has a cost type c, drawn from the same distribution F. The leader's cost type is his private information. Everything else in the game is common knowledge.

The payoff for a citizen of country i with cost type c depends on whether the two leaders are hawkish or dovish. It 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. 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 defending yourself against an attack.

Assumption 1. We assume

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

After the two leaders have chosen their strategies, each citizen decides whether or not to support his leader. Citizen i supports leader i if and only if leader i's action was a best-response to leader j's action *according to citizen i's preferences* (as given by (1)). Leader i needs the support of at least a fraction $\sigma_i^* \leq 1/2$ of his population in order to stay in power.[2] The value of staying in power is $R > 0$, which we refer to as the *rents from office*. To simplify the exposition, we assume $R < \mu$. This assumption guarantees that the most aggressive leader (cost type $c = 0$) always prefers to choose H, even if this means he risks losing power. Removing this assumption will not change our main results, but it would introduce the possibility of multiple equilibria, without adding any insights.

A citizen of cost 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. The fraction of citizens who are greedy is $F(\mu)$. A citizen of cost 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. The fraction of citizens who are pacifistic is $1 - F(d)$. A citizen of cost type c is an *intermediate type* if $\mu < c < d$. The intermediate type is neither greedy nor a pacifistic: he thinks the best response to H is H, and the best response to D is D. The fraction of citizens who are intermediate types is $F(d) - F(\mu)$. For the intermediate type, there is no dominant strategy: the game is akin to a stag-hunt game, where the best response is to match the action of the opponent. Assumption 1 implies that the median citizen is an intermediate type. Thus, the representative (median) citizen does not want to initiate aggression if the opponent is peaceful, which is consistent with the democratic peace hypothesis. However, if he thinks the other leader is a hawk, then he wants his own leader to be a hawk, which is the basis for Schelling's dilemma.

Without greedy types, there would be an equilibrium where D is chosen with probability one. Therefore, in order to analyze Schelling's dilemma we need $F(\mu) > 0$. On the other hand, pacifistic types do not play any role in the dilemma, and in fact Baliga and Sjöström [2] assumed they did not exist ($1 - F(d) = 0$). Here we will weaken that assumption to the following:

Assumption 2. Greed is more prevalent than pacifism: $F(\mu) > 1 - F(d)$.

If leader i takes the hawkish action, then he is definitely supported by the greedy types, but he is supported by the intermediate types only if the opponent is also hawkish. If leader i takes the dovish action, then he is definitely supported by the pacifistic types, but he is supported by the intermediate types only if the opponent is also dovish. The following table shows the types of citizens who support leader i, and in parenthesis their fraction of the population. The row represents the choice of leader i and the column represents the choice of the

[2] The case where the leader needs a *supermajority* $\sigma_i^* > 1/2$ to stay in power is not very interesting and is not considered here.

opponent, leader j.

$$\begin{array}{cc|c} & H & D \\ H & \text{Greedy and Intermediate } [F(d)] & \text{Greedy } [F(\mu)] \\ D & \text{Pacifist } [1-F(d)] & \text{Pacifist and Intermediate } [1-F(\mu)] \end{array} \tag{3}$$

Assumptions 1 and 2 imply

$$1 - F(d) < F(\mu) < \frac{1}{2} < 1 - F(\mu) < F(d) \tag{4}$$

In order to maximize his support, the leader should match the opponent's behavior, since this is what the median citizen wants. Deviations lead to loss of support. If leader i responds to a hawkish opponent by choosing D instead of H, then he suffers a net loss of support equal to $F(d) - (1 - F(d)) > 0$. On the other hand, if leader i responds to a dovish opponent by choosing H instead of D, then he suffers a net loss of $(1 - F(\mu)) - F(\mu) > 0$. Assumption 2 implies

$$F(d) - (1 - F(d)) > (1 - F(\mu)) - F(\mu).$$

Thus, taking the "wrong" action when the opponent is a hawk is more costly, in terms of loss of support, than taking the "wrong" action when the opponent is a dove. Leader i's support reaches a minimum, $1-F(d)$, if he responds dovishly to a hawk. This is consistent with Schelling's analysis [19], which emphasizes fear as a driving motive for action.

The model suggests that there are three kinds of political regimes. First, if $\sigma_i^* \leq 1 - F(d)$, then leader i can never lose power, since his support is never less than $1 - F(d)$. Therefore, if $\sigma_i^* \leq 1 - F(d)$ then country i is classified as an *autocracy*. In an autocracy, domestic political survival is guaranteed, and domestic politics plays no role in the leader's decision-making. Hence, the leader's payoff function is simply given by (1), where c is his cost type.

Second, if $1 - F(d) < \sigma_i^* \leq F(\mu)$, then country i is classified as a *limited democracy*. Notice that $1 - F(d) < \sigma_i^*$ means leader i loses power if only the *pacifists* support him, while $F(\mu) \geq \sigma_i^*$ means leader i stays in power if only the *greedy* types support him (he does not need the support of the median voter). Hence, the only case where he will not enjoy rents from office is if he is dovish and his opponent is hawkish. Therefore, leader i's payoff matrix is

$$\begin{array}{cc|c} & H & D \\ H & R-c & R+\mu-c \\ D & -d & R \end{array} \tag{5}$$

where c is his cost type.

Finally, if $F(\mu) < \sigma_i^* \leq 1/2$ then country i is classified as a *full democracy*. The leader of a full democracy needs the support of the median voter to stay in power. Indeed, if he miscoordinates with the opponent, then his support is either $F(\mu)$ or $1 - F(d)$ (see (3)), and in either case, he will be ousted. Since the median voter is an intermediate type, leader i enjoys rents from office if

and only if he matches the action of the opponent. Therefore, leader i's payoff matrix is

$$\begin{array}{ccc} & H & D \\ H & R-c & \mu-c \\ D & -d & R \end{array} \tag{6}$$

where c is his cost type.

3 Equilibrium

Let country i's regime type be denoted $T_i \in \{A, F, L\}$, corresponding to autocracy, full democracy, and limited democracy. Leader i knows the regime type of country j but does not know the cost type of leader j. Leader i's optimal decision depends on his own cost type, his own regime type, and the probability he assigns to the event that leader j plays H.

First, if country i is an autocracy, then the payoffs of leader i are given by (1). Hence, if the probability that leader j plays H is p_j, then leader i prefers H if

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

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

$$h(p_j, A) \equiv F\left(\mu + (d-\mu)\, p_j\right) \tag{7}$$

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

Second, in a limited democracy, leader i's payoffs are given by (5). Hence, if the probability that leader j plays H is p_j, then leader i 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 $c_i \leq \mu + p_j\left(d + R - \mu\right)$. Therefore, the probability that the leader of country i chooses H is $p_i = h(p_j, L)$, where

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

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

Third, in a full democracy, leader i's payoffs are given by (6). If leader j chooses H with probability p_j, then leader i prefers H if

$$p_j R + (1-p_j)\mu - c_i \geq -p_j d + (1-p_j)R \tag{9}$$

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 $p_i = h(p_j, F)$, where

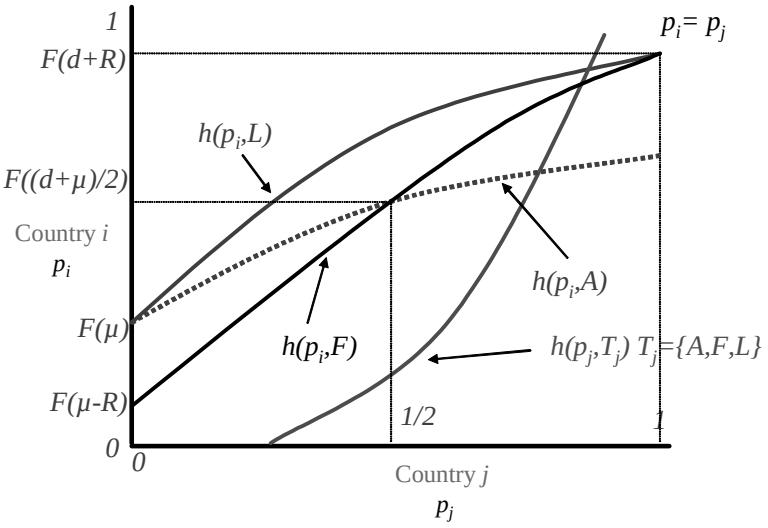
$$h(p_j, F) \equiv F\left((2R + d - \mu)\, p_j + \mu - R\right) \tag{10}$$

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

Since F is strictly increasing and concave, the best-response functions are also increasing and concave. Concavity implies that the two leader's best response functions $h(p_2, T_1)$ and $h(p_1, T_2)$ intersect only once. The point of intersection is the unique equilibrium. In equilibrium, each leader chooses H with a probability strictly greater than zero, as he may be a greedy type, and strictly less than one, as he may be a pacifist. Finally, as the best response functions are strictly increasing, the conflict game is one of strategic complements (each leader is more likely to choose H, the more likely he thinks it is that the opponent chooses H). Changing the regime type of one country simply shifts that leader's best response function. This allows us to consider the effect of political institutions on incentives for aggression.

For any given $p_j > 0$, $h(p_j, L) > h(p_j, A)$. Thus, the probability that leader i plays H is strictly bigger if country i is a limited democracy than if it an autocracy. The incentive to choose H is higher in a limited democracy, because if the opponent chooses H, then the leader of a limited democracy cannot stay in power if he plays D, but the autocratic leader can. Of course, p_j has to be determined in equilibrium. Strategic complementarity implies that replacing an autocracy in country i with a limited democracy increases the equilibrium levels of both p_i and p_j, whatever the regime type in country j. This can be seen in Figure 1, where country j's probability of playing H is on the horizontal axis and country i's on the vertical axis. Suppose initially, country j's regime type is $T_i \in \{A, L, F\}$, and country i's regime type is autocracy. The equilibrium is the intersection of $h(p_i, A)$ and $h(p_j, T_j)$. Changing country i's regime type from autocracy to limited democracy shifts the best response function from $h(p_i, A)$ to $h(p_i, L)$, which increases both p_1 and p_2.

Figure 1
Autocracy vs. Ideal or Limited Democracy



Similarly, for any given $p_j < 1$, the probability that leader i plays H is strictly bigger if country i is a limited democracy than if it a full democracy. The incentive to choose H is higher in a limited democracy, because if the opponent chooses D, then the leader of a limited democracy can stay in power even if he plays H, but the fully democratic leader cannot. Strategic complementarity implies that replacing a limited democracy in country i with a full democracy reduces the equilibrium levels of both p_i and p_j, whatever the regime type in country j. Again, this can be seen in Figure 1 (the best response function from $h(p_i, L)$ to $h(p_i, F)$).

We summarize these arguments as follows:

Proposition 1 *Replacing any other regime type in country i with a limited democracy increases the equilibrium probability of conflict, whatever the regime type in country j.*

Next, consider the *democratic peace* hypothesis: are full democracies more peaceful than autocracies? Our model gives no unambiguous answer. Facing a hawkish opponent, there is a hawkish bias in full democracies, because the leader only survives if he responds to H with H. But facing a dovish opponent, there is a dovish bias in full democracies, because the leader only survives if he responds to D with D. If the opponent is equally likely to choose D and

H, $p_j = 1/2$, then the two biases cancel out. If $p_j < 1/2$ then the dovish bias dominates and the leader of the full democracy is more likely to choose D than than the autocratic leader. However, if $p_j > 1/2$ then the hawkish bias dominates and the leader of the full democracy is more likely to choose H than than the autocratic leader. (Figure 1 above also illustrates these properties.) Hence, there is no unambiguous support for the democratic peace hypothesis. In a peaceful environment, the representative citizen will have a relatively high cost of going to war, the equilibrium probabilities of playing H will be less than one half, and the democratic peace hypothesis will hold. But conversely, if the representative cost of going to war is low, then the equilibrium probabilities of playing H will be bigger than one half, and the democratic peace hypothesis will not hold. In the latter case, a full democracy is a "Hamas democracy" that increases the probability of conflict. We summarize these arguments as follows (the proof is in the Appendix):

Proposition 2 *If c^{med} is sufficiently high, replacing any other regime type in country i with a full democracy decreases the equilibrium level of conflict, whatever the regime type in country j. If c^{med} is sufficiently low, replacing any other regime type in country i with a full democracy decreases the equilibrium level of conflict, whatever the regime type in country j.*

4 Empirical Analysis

4.1 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 $t = 1885, ..., 1992$. Either all or part of this data has been used in almost all empirical studies of the democratic peace hypothesis. Three forms of conflict data have been considered: monadic, undirected dyads and directed dyads. 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.[3] The original COW data is in monadic form, and forming the dyadic data often requires additional information not reported in the 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 competitiveness of political participation, competitiveness of the process for selecting the chief executive, regulation of political

[3] 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.

participation, openness of executive recruitment and constraints on the chief executive are used to construct democracy and autocracy scores ranging from 0 to 10 for each regime. Oneal and Russett [16] 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.

4.2 Empirical Model

Our empirical strategy has two steps. We first utilize the Polity *net democracy* index to construct a set of dummy variables that classify the regime types of the two countries in each dyad. We then study the impact of regime type pairs on the probability of militarized dispute (MID) by running panel logit regression 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.[4] Militarized disputes are also the object of analysis in much of the recent empirical literature and studying MIDs increases the amount of available data.

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 into 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.

[4] 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.

	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.[5] The entire set of dummy variables cannot be separately identified from the constant term, and thus one variable is excluded from the estimation procedure. We 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 us to rank 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 into a militarized dispute, so that all the estimated parameters $\hat{\gamma}'_j s$ should be negative.

We are also interested in testing the democratic peace hypothesis, which suggests that a pair of full democracies is the least likely to enter into conflict. 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

[5] The function $G(z) \equiv \exp(z)/(1 + \exp(z))$ is the c.d.f of the logistic distribution function. For a review of qualitative response models and their panel specifications see chapter 15 of [21].

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.[6] There are six additional controls which are again used in the existing empirical literature.

First, it may be the case that the level of trade between two countries affects the probability of conflict. We follow Oneal and Russett [16] and assume the country with "the least to lose" in terms of trade is the most likely to initiate conflict. Hence, we use the variable $MinDep = \min\{trade_1, trade_2\}$ where $trade_i$ $(i = 1, 2\}$ is the sum of imports and exports between country i and country j divided by country i's GDP.

Second, if a country is a major power, it may affect its incentives to go to war. On the one hand, it may have more of an incentive to war as it can escape retaliation. Or it may be less likely to be aggressive, if it can achieve its objectives without conflict. We control for these effects with the dummy variable $MajPower_t$ which is set equal to one if at least one of the two countries is a major power at time t.

Third, if the two countries in a dyad are formally allied by a non-aggression or neutrality treaty, we set an allies dummy variable equal to one.

Fourth, an imbalance of military power may create conflict. The COW data contains a measure of military power which gives equal weight to total population, urban population, energy consumption, iron and steel production, military manpower and military expenditure. The variable $LogCapRatio$ is the log of the maximum to the minimum level of military capabilities (see Oneal and Russett [16]).

Fifth, countries which are next to each other may be more likely to go to war as there may be more contentious issues and also because it is easier to go to war. Hence, we define a contiguity dummy variable which is set equal to one if the two countries share borders or have colonies that share a border.

Finally, $SystSize_t$ controls for number of countries at date t.

4.3 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

[6] 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 [**?**]).

D_j's coefficient and that of D_{33} (a pair of two democracies).[7] 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.

With the exception of model (4) all models are panel logit models with fixed effects defined at the directed dyad level. Model (1) is our baseline specification and includes all the data from 1885-1992. Models (2) and (3) split the sample of observations used in Model (1) into post and pre-World War II data. 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. It uses the entire sample of conflict data. Finally, Model (4) is a pooled logit model without fixed effects, and thus differs from the remaining models in that it considers both within and between variation of the directed dyads.[8]

	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).

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

[8] 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.

We now analyze the empirical results by discussing the signs, ordering and significance of the coefficient on the dummy variables. As discussed above, 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 pair of anocracies is the most prone to engage in a militarized dispute. 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). Model (5) which studies different definitions for the three regimes broadly confirms the results supporting out theory obtained in Model (1). The democratic peace hypothesis also gets support for this alternative specification.

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, our hypothesis that anocracies are the most aggressive 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.

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 our theory 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.

5 Appendix

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.

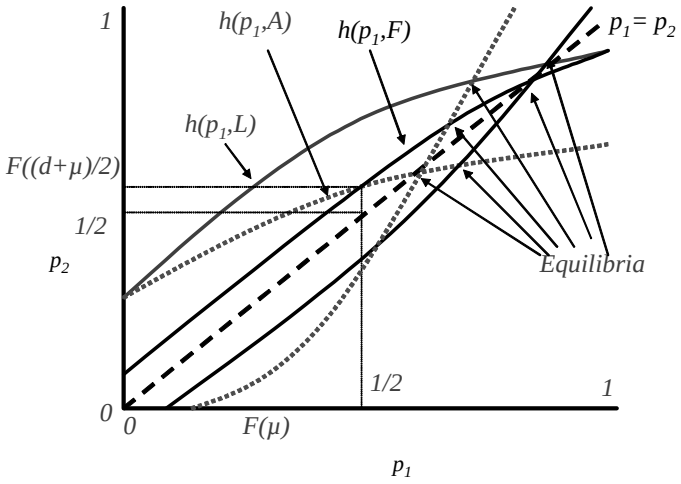
Since the two best response curves intersect, it cannot be determined a priori whether a full democracy be more or less hawkish than an autocratic regime. It depends on the equilibrium probability that the opponent is a hawk.

Case I Median voter is tough: $c^{med} < (d+\mu)/2$. In this case the median citizen 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 2: 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.

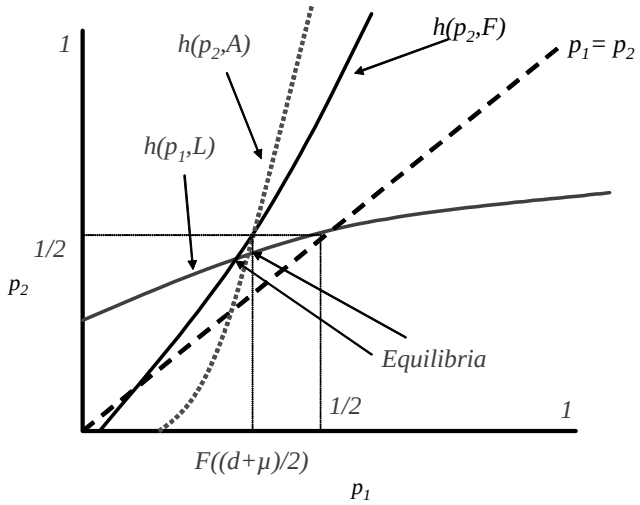
Case II Median voter is soft: $c^{med} > (d + \mu)/2$ and

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

In this case the median citizen 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.

Also, 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 less than $1/2$:

Figure 3: Case II



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 interactions that do not involve limited democracies. Therefore, autocracies are more hawkish than full democracies in all interactions. In case II, interactions between full democracies and limited democracies are relatively peaceful, because the median citizen is fairly peaceful. Interactions between autocracies and limited democracies are less peaceful, because the autocratic leader does not care about the median citizen's preferences. In case II, 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.

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