CESifo *Working Paper Series*

WAR AND DEMOCRACY

Gregory D. Hess
Athanasios Orphanides*

Working Paper No. 201

November 1999

CESifo
Poschingerstr. 5
81679 Munich
Germany
Phone: +49 (89) 9224-1410/1425
Fax: +49 (89) 9224-1409
http://www.CESifo.de

---

* We would like to thank Bruce Bueno de Mesquita, Dennis Epple, Ed Mansfield, Allan Meltzer, Jim Morrow, Richard Porter, Bruce Russet and Alastair Smith for helpful comments. We would also like to thank seminar participants at the Society for Economic Dynamics and European Economics Association conferences, the European University Institute, the London School of Economics, the Universities of East Anglia, Munich, Southampton and Warwick, Oberlin College and the Federal Reserve Bank of Cleveland. Part of this document was written while Hess was a visiting scholar at the Hoover Institution, whom he thanks for their hospitality Any remainig errors are our own. The opinions expressed are those of the authors and do not necessarily reflect views of the Board of Governors of the Federal Reserve System.

CESifo *Working Paper No. 201*
November 1999

WAR AND DEMOCRACY

Abstract

This paper presents a general equilibrium model of conflict based on a world populated by representative democracies. At the individual state level, when information regarding a leader's ability to defend the state against unavoidable conflict is valuable to voters, an incumbent leader seeking reelection may be tempted into potentially avoidable conflicts to demonstrate his ability and enhance his reelection prospects. As a result, democratic states may be responsible for at least some international conflict. In this paper, we investigate whether this motive is sufficiently important for war to persist in equilibrium if all countries are democracies.

Three key findings emerge. First, the perpetual peace equilibrium hypothesized by Immanuel Kant (1795, 1991) always exists. The reason is that in the absence of the threat of war, leaders are unable to divert the public's attention away from domestic considerations. Consequently, the incentive for potentially avoidable conflicts vanishes. Second, if leaders are not sufficiently benevolent and wars are costly in expectation, then additional equilibria exist with a positive war frequency. Third, if multiple equilibria exist, the perpetual peace equilibrium may be unstable in which case an equilibrium with positive war frequency becomes the only stable outcome.

The model is further extended to analyze the role of appropriative conflicts and non-democratic regimes. It is shown that if the diversionary motive of democratic leaders is strong, a more democratic world may not necessarily be more peaceful. We discuss the role that norms and institutions can play in facilitating a more peaceful world with democracies – for example, free trade areas and alliance formation.

Keywords: War, Democracy, Kant Hypothesis

JEL Classification: D72, D74, H56

Gregory D. Hess
Oberlin College
Department of Economics
Rice Hall
Oberlin, OH 44074
USA
Email: gregory.hess@oberlin.edu

Athanasios Orphanides
Board of Governors
of the Federal Reserve System
Federal Reserve Board
Washington, D.C. 20551
USA
Email: aorphanides@frb.gov

> Thus as far as right is concerned, republicanism is in itself the original basis of every kind of civil constitution, and it only remains to ask whether it is the only constitution which can lead to a perpetual peace.
>
> Kant (1795, 1991), p. 100.

1 Introduction

Immanuel Kant's conclusion was that indeed, democracy offers the prospect of attaining perpetual peace. With the prospect of a fully democratic world appearing far out of reach, however, Kant's hypothesis has been but a theoretical possibility. Until recently that is. The end of the Cold War has unleashed a new era onto existing national and international political institutions. With the end of the bi-polar rivalry between the United States and the Soviet Union which dominated foreign policy activity during the Cold War period, the world has experienced a significant increase in democratic governance.[1] As countries that ten or twenty years ago would hardly have been expected to institute democratic reforms have done so, optimistic speculation as to the beneficial consequences of the spread of democracy for the peaceful resolution of international conflict has been encouraged.

Doyle (1986) championed Kant's liberal internationalism as the key paradigm for understanding the peaceful relationships between democracies based on their observed caution towards war's costliness and appreciation of the rights of individuals in foreign republics.[2] Russett (1993) classifies the two major arguments which make the Kant hypothesis operational as those based on 'Norms and Culture' and 'Structural and Institutional Constraints'. The former emphasizes that a fundamental basis of democracies is that domestic disagreements are settled by compromise and non-violent means. This domestic pattern in turn creates an atmosphere or norm by which international disagreements between democratic governments would also be resolved. The latter proposes that democracies have internal checks and balances of authority even with regard to foreign policy, such that any foreign

[1] Freedom House reports that while in 1986 there were 56 free countries, 56 partly free countries and 55 countries that were not free, in 1996 76 countries were free, 62 countries were partly free, and 53 were not free. Their definition of freedom is closely associated to democratic governance.

[2] Doyle (1986) also emphasizes Kant's point that while democracies may form a separate peace between themselves, they will use liberal reasons for conflict with non-democracies.

policy adventure must be widely discussed and the public's support gained prior to embarking upon a war. This institutional sluggishness makes it less likely that wars will actually be undertaken and more likely that potential confrontations can be resolved peacefully.

The evidence for the overall disinclination of democracies to engage in war is decidedly mixed, but has recently been clarified in a number of papers which distinguish between regime types of countries in conflict, e.g. see Maoz and Abdolali (1989), Morgan and Campbell (1991), Maoz and Russett (1993), Russett (1993), Bueno de Mesquita and Lalman (1992), and Siverson and Bueno de Mesquita (1996,1997). Importantly, these papers provide strong historical evidence that the use of force and wars between democracies is infrequent, and that the frequency of war increases when at least one country is a non-democracy. For example, using the Militarized Interstate Disputes (MID) data from the Correlates of War (COW) Project, Russett (1993) reports no wars between democracies from 1946-1986. In contrast, he identifies 32 yearly incidents in which a war involving at least one non-democratic country occured.[3] Together, this empirical evidence has lent support to the conjecture that if the world consisted of just democratic regimes, conflict would diminish or perhaps disappear altogether.[4]

Unfortunately, as history has not provided us with a period in which only democratic states govern, empirical evidence can only be suggestive. Further, sample selection issues complicate any inference about the relationship between regime type and conflict based on the observed data. As argued by Morgan and Campbell (1991), since few states have been classified as democracies in the data employed, the finding that the frequency of full scale

[3]These results are presented in Table 1.2 of Russett (1993). For the more limited 'use of force', there were eight times in which a given year experienced this type of conflict between democracies, as compared to 521 when at least one country was non-democratic. Wars are defined as at least one thousand battle deaths, where each country had at least one hundred battle deaths and mobilized at least one thousand troops. The original data is described in Small and Singer (1982). The use of force is defined as a blockade or conflict when there were fewer casualties or mobilizations than that needed for the war definition. Forsythe (1992), however, points out that during the Cold War period the U.S. was engaged in 'covert action' against six non-European democracies. He concludes that 'the neo-Kantian reliance on representative decision-making to avoid major war did not affect secret decisions.'

[4]Weart (1998) provides a recent exhaustive comparative case study of **every** borderline case throughout recorded history where democracies confronted one another with military force. He concludes that well-established democracies have **never** made war on each other. However, in coming to this conclusion, he distinguishes between oligarch republics and democratic republics: the distinguishing characteristic being that the former suppress some internal 'enemy' class. He concludes that while oligarch republics have only rarely fought each other, oligarch republics and democratic republics have fought each other throughout history.

conflicts involving at least one non-democracy is higher than that between two democracies could easily be a matter of chance. Therefore, the empirical methods based on observed evidence can provide only limited scope for predicting the likelihood of a democratic peace.

Additional light can be shed on the likelihood of perpetual peace in a democratic world by investigating the theoretical basis for the hypothesis. This paper begins such an investigation by building a model of world-wide democracy in which the equilibrium frequency of war is endogenously determined. Our primary goal is to present a framework that identifies some of the issues relevant for the attainment of perpetual peace. Initially, we examine a general equilibrium model of the world in which all states are representative democracies. By construction, the elimination of all war would be Pareto improving for all states. Hence, trivially, if individual voters were to determine war decisions, war would be always avoided.[5] In our investigation, however, we take seriously an institutional aspect of modern democracies largely ignored in Kant's argument; namely, that citizens elect leaders as their agents and do not therefore control the day-to-day operations of government. Further, imperfections may arise from the re-election motive of partially benevolent leaders.[6] Building on the partial equilibrium model of endogenous war decisions by Hess and Orphanides (1995), we examine the implications in general equilibrium.

Our approach initially concentrates on the potential role of war as a rational diversion from poor domestic economic performance.[7, 8] In this setting we first investigate whether

[5]In Kant's words, "If, as is inevitably the case under this constitution, the consent of the citizens is required to decide whether or not war is to be declared, it is very natural that they will have great hesitation in embarking on so dangerous an enterprise." (op. cit.)

[6]Cukierman and Meltzer (1986) label the welfare loss associated with a leader's use of discretion for political gain as 'the cost of democracy'. In general, this cost can be due to either asymmetric information or the strategic timing of the learning of new information.

[7]Other models of wars as a rational diversion are Downs and Rocke (1994), Richards, *et al.* (1993), and Smith (1996). Empirical evidence suggesting a possible link between the incidence of war the political cycle and/or the business cycle are has been provided by several studies including Stoll (1984), Ostrom and Job (1986), Russett (1990), Lian and Oneal (1993), Hess and Orphanides (1995,2000), DeRouen (1995) and Wang (1996). See Levy (1989) for a critique of the diversionary theory of war.

[8]In a related study, Garfinkel (1994) demonstrated that the prevalence of democracy would influence the frequency and severity of war in the context of only appropriative conflicts. She constructs a general equilibrium model of international conflict where democracies are represented by domestic political competition between two parties facing future electoral uncertainty. Within a state this leads to lower expenditures on military goods. In equilibrium this creates a strategic complementarity which reduces the severity of conflict with democracies as opposed to non-democracies. Alesina and Spolaore (1996) also analyze international conflict in an economic model of democracy. The find that if there is a decrease in international conflict there will be an increase in the number of new countries formed from agents who have succeeded and formed

the Pareto optimal world peace equilibrium can be supported as the steady state equilibrium outcome. We find that if war is not too costly, or leaders are largely benevolent, world-wide peace indeed prevails as the unique steady state outcome. With partially benevolent leaders, however, we uncover that world-wide peace, while possible in steady state, becomes an unstable equilibrium. In this case, the only stable world-wide equilibrium implies that wars occur with positive frequency.

We then introduce two additional elements of realism into our analysis. First, in addition to the diversionary motive for conflict which is never beneficial for the citizens of a democracy, we allow for additional conflicts that are appropriative in nature and potentially welfare improving.[9] Second, as the world is not populated solely by democratic governments, we incorporate into our model the existence of non-democratic governments whose motivation for engaging in conflict may differ from those of democracies. Finally, we consider the role of appropriative wars and non-democratic regimes to address the question of whether a more democratic world will necessarily be more peaceful.

We conclude that the hypothesis that perpetual peace would necessarily prevail if only all states were democratic is false, as is the hypothesis that a more democratic world would necessarily be more peaceful. Rather, the institutional details and norms regarding the structure of democracy, trade arrangements and alliances appear important and international co-ordination may remain integral for the achievement of perpetual peace.

2 A General Equilibrium Model of War

To begin our investigation of war and democracy, we assume that the world consists only of a large number of identically structured democratic states. Our objective is to examine the propensity of each state to initiate conflict and then analyze the equilibrium implications of such strategies.

Each state is assumed to be a representative democracy populated by ex ante identical

new countries. Thus even with a smaller probability of conflict for each nation, the existence of more nations may imply that the frequency of war occurrence may not fall. They use this aspect of the model to argue that the peace dividend for the world may therefore be quite small even with the end of the cold war.

[9]See Garfinkel and Skaperdas (1996) and the papers therein for a broader examination of the role of appropriative activity and its affect on an economy's resource allocation.

individuals. Leader candidates are drawn from the general population and have idiosyncratic characteristics/abilities which affect the public's welfare during their stay in office. There is a two-term limit on leadership.

The theory is presented in the following sub-sections. We first examine individual leaders' war decisions and then compute the propensity of war initiation depending on the term of service. Second, we compute the aggregate propensity of war initiation in equilibrium, and derive the equilibrium condition by aggregating across all states. Finally, we examine properties of the resulting equilibria, in particular multiplicity and stability of alternative steady states and the resulting frequency of war.

2.1 War Decisions in a Democracy

Our model of democracy follows the framework proposed in Hess and Orphanides (1995). Each state consists of a large number of ex ante identical citizens/voters. Elections are held at the beginning of every period between either the current incumbent and a new candidate or two new candidates. New candidates are drawn randomly from the electorate. Consumption in every period is determined by two factors: First, whether or not the state is engaged in war; and second on two idiosyncratic characteristics of the elected leader. In the absence of war, consumption equals γ, a measure of a leader's economic ability. In case war erupts, consumption is the sum of γ and δ, a measure of the current leader's ability to contain the cost of war. Thus, consumption, c_t, is:

$$c_t = \gamma_t + s_t \delta_t \tag{1}$$

where s_t takes the values one or zero depending on whether the state is engaged in war during period t. The characteristics γ and δ for each potential leader are independently drawn from the distributions $G(\gamma)$ and $D(\delta)$. By assumption, peacetime consumption is positive with γ being uniformly distributed over $[0, 1]$, while the cost of war characteristic, δ, is equal to $-\Delta$ with probability p, and 0 with probability $1-p$. We assume that information is symmetric to voters and candidates, and that the candidates' and leaders' idiosyncratic

abilities are unknown and become known only when put to use.[10]

Voters are risk-neutral and vote to select the leader who maximizes their expected welfare, W_t:

$$W_t = E_t \sum_{s=t}^{\infty} \theta^{s-t} c_s \tag{2}$$

where θ is the discount factor, $0 < \theta < 1$. Voting is based on information regarding the candidates' characteristics γ and δ. Thus, when an election is held between two new candidates, voters are indifferent between the two as both candidates would yield, in expectation, the same welfare. We denote this expected welfare associated with a new leader of unknown characteristics with $\overline{W}$.[11] The only interesting choice faced by voters is when an election is held between an incumbent leader and a new candidate. In that case, voters evaluate whether expected welfare associated with voting for the incumbent exceeds $\overline{W}$ using the information known about the incumbent. If so, they vote to reelect the incumbent, otherwise they opt for a new leader.

Leaders derive rents x per period when in office. We assume that they are only partially benevolent so that in taking decisions they maximize a linear combination of their rent and the public's welfare. Letting π, denote the probability with which they will be reelected, a leader's welfare is:

$$V_t = (1-\rho)W_t + \rho(x + \theta x \pi) \tag{3}$$

where ρ is a measure of a leader's selfishness, i.e. the weight he places on the rents from being in office rather than the public's welfare.

During a term, a leader is faced with the possibility of international conflict. Most often, these conflicts can be resolved peacefully, at essentially no welfare cost to the public. Sometimes, however, such a conflict may result in war. To examine the propensity to

[10] This approach is sometimes referred to as 'All voters are from Missouri', the show-me state (see Rogoff and Sibert (1988) and Rogoff (1990)). This assumption rules out the possibility that a leader can claim a good war handling ability even without entering a conflict. If this were possible, then every leader would claim that a critical situation had happened, was successfully avoided, and that the leader deserved great praise and support. But this is simply not verifiable.

[11] We proceed by deriving the voter and leader strategies conditional on $\overline{W}$. In equilibrium, we treat $\overline{W}$ as endogenous. See the Appendix for a derivation of $\overline{W}$.

engage in warfare at the individual state level, we assume that both voters and leaders in any individual state take the probability that war may be forced upon the state in any term as exogenously given and equal to α.[12] Given this probability, we can then determine the extent to which a leader may have the incentive to engage the state in a war that could potentially have been avoided. As shown in Hess and Orphanides (1995), this incentive may be present only if a leader is serving his first term and fears that his domestic handling abilities are such that in the absence of war, he would lose his reelection bid. Under those circumstances, if the leader could gain reelection by demonstrating superior war handling abilities, he may be tempted to initiate such a potentially avoidable conflict. Specifically, this temptation is present if the leader's domestic handling characteristic falls within a specific range which depends on α and is described in detail in the following sub-sections. Table 1 provides a summary of the timing of events during the first term of a newly elected leader.

2.2 Reelections

Three critical values for the leader's domestic handling characteristics, γ, describe voter behavior. The largest, $\hat{\gamma}$, defines a level of excellence such that an incumbent with $\gamma \geq \hat{\gamma}$ would be reelected even with a demonstrated inferior war handling ability. The smallest, $\underline{\gamma}$, defines domestic handling so poor such that at that level an incumbent with $\gamma < \underline{\gamma}$ would be voted out of office even with demonstrated superior war handling ability. In between, reelection decisions depend on both characteristics. The critical value γ^* defines the economic handling ability characteristic such that incumbents with $\gamma \geq \gamma^*$ gain reelection if no war has taken place and the reelection decision must be based solely on γ. Starting with γ^*, we provide a characterization of these critical values.

Given the expected welfare associated with a new leader, $\overline{W}$, the reelection condition is:

$$\gamma^i + \alpha\delta^i \geq \overline{W}(1-\theta) \tag{4}$$

[12]For the individual state, α, is taken as given. In the following sub-sections α is, of course, endogenized as we aggregate across states.

Thus, in the absence of war, reelection is ensured for any $\gamma \geq \gamma^*$ defined as:

$$\gamma^* \equiv \overline{W}(1-\theta) - \alpha\overline{\delta} \tag{5}$$

where $\overline{\delta} = -p\Delta$ is the expectation of δ.[13]

Next consider the case where the leader's economy handling skills are so good that he will be reelected even if a war reveals poor war handling ability, $\delta = -\Delta$. In this case:

$$\gamma^i - \alpha\Delta \geq \overline{W}(1-\theta) \tag{6}$$

Using (6) we can define this 'most excellent' γ that ensures reelection regardless of the leader's war handling ability as:

$$\hat{\gamma} \equiv min\{1, \overline{W}(1-\theta) + \alpha\Delta\} \tag{7}$$

noting that if α is too high, $\hat{\gamma}$ may equal 1, the best economy handling characteristic. Note that leaders with $\gamma \in [\gamma^*, \hat{\gamma}]$ would gain reelection in the absence of war but might lose if a war were to breakout and an inferior war handling ability, $\delta = -\Delta$, were revealed. Such leaders would have the strongest incentive to preserve peace in this framework.

While a poor war handling ability may hurt a candidate with a good economic handling characteristic, the revelation of a superb war handling ability may still not salvage the reelection prospects of a leader with a poor economic handling performance. For instance, the γ such that reelection would not occur even with the good war characteristic satisfies:

$$\gamma^i < \overline{W}(1-\theta) \tag{8}$$

Define these 'unsalvageable' candidates as those with $\gamma \in [0, \underline{\gamma}]$, where $\underline{\gamma}$ satisfies:

$$\underline{\gamma} \equiv max\{0, \overline{W}(1-\theta)\} \tag{9}$$

[13] It is straightforward to verify that $0 < \gamma^* < 1$.

Unsalvageable candidates will never engage in avoidable wars as it does not improve their reelection prospects and it lowers the public's expected welfare. The most relevant region where a war may lead to reelection while the leader would lose in the absence of war is $\gamma \in (\underline{\gamma}, \gamma^*)$. Whether a leader will be tempted to engage in war depends on the difference between the leader's welfare in the absence and presence of war, V^n and V^w, respectively. That is:

$$V^n = (1-\rho)(\gamma + \theta\overline{W}) + \rho x \tag{10}$$

$$V^w = (1-\rho)\left\{\gamma - p\Delta + p\theta\overline{W} + (1-p)\theta(\gamma + \theta\overline{W})\right\} + \rho\left\{x + (1-p)\theta x\right\} \tag{11}$$

If $V^n - V^w = 0$ has a zero in $(\underline{\gamma}, \gamma^*)$ that zero will define γ_* so that the leader engages in a potentially avoidable war if and only if $\gamma \in (\gamma_*, \gamma^*)$. Otherwise, if $V^n - V^w > 0$ for all $\gamma \in (\underline{\gamma}, \gamma^*)$ the leader will not initiate war for any γ and he will act in accordance with the public interest. We refer to this as the benevolent leader case. Likewise, if $V^n - V^w < 0$ for all $\gamma \in (\underline{\gamma}, \gamma^*)$ the leader will initiate war whenever it can possibly raise his probability of reelection. We refer to this as the selfish leader case.

Solving $V^n - V^w = 0$ for γ yields:

$$\gamma_0 = (1-\theta)\overline{W} + \left[\frac{p\Delta}{(1-p)\theta}\right] - \left[\frac{\rho x}{1-\rho}\right] \tag{12}$$

Then, γ_* is defined as:

$$\gamma_* = min\{max\{\underline{\gamma}, \gamma_0\}, \gamma^*\} \tag{13}$$

From the definition of γ_0 and γ_*, it is clear that the decision to start a potentially avoidable war depends crucially on the leader's selfishness, ρ. The minimum ρ such that the leader behaves selfishly is ρ such that $\underline{\gamma} = \gamma_0$, namely:

$$\overline{\rho} = \frac{p\Delta}{p\Delta + \theta x(1-p)} \tag{14}$$

If $\rho > \overline{\rho}$, then a leader will initiate a war whenever $\underline{\gamma} \leq \gamma < \gamma^*$, i.e. will be indistinguishable

from a totally selfish leader. That is, if $\rho \geq \overline{\rho}$, $\gamma_* = \underline{\gamma}$. Otherwise, if $\rho < \overline{\rho}$, $\gamma_* > \underline{\gamma}$ whenever $\alpha > 0$. That $\overline{\rho}$ is independent of α is due to our assumption of a binary distribution for δ. This convenient case will serve as a benchmark in the investigation of equilibria below since unless war can be supported in equilibrium when leaders act selfishly, it will not be supported with partially benevolent leaders.

The unconditional probability of a leader's reelection, $\Pi(\alpha)$, is determined by the five possible regions of γ outlined above. Leader's with $\gamma \in [0, \underline{\gamma})$ have zero probability of reelection, those with $\gamma \in [\underline{\gamma}, \gamma_*)$ have reelection probability $\alpha(1-p)$, those with $\gamma \in [\gamma_*, \gamma^*)$ have reelection probability $(1-p)$, those with $\gamma \in [\gamma^*, \hat{\gamma})$ have reelection probability $(1-\alpha)+\alpha(1-p)$, while those with $\gamma \in [\hat{\gamma}, 1]$ have reelection probability one. Utilizing that γ is uniformly distributed over the unit interval, the unconditional probability of a leader's reelection is:

$$\Pi(\alpha) = (\gamma_* - \underline{\gamma})\alpha(1-p) + (\gamma^* - \gamma_*)(1-p) + (\hat{\gamma} - \gamma^*)(1-\alpha p) + (1-\hat{\gamma}) \tag{15}$$

where γ^*, $\hat{\gamma}$, $\underline{\gamma}$ and γ_*, are defined in expressions (5), (7), (9) and (13), respectively.

2.3 The Supply of Potentially Avoidable War

Given α, we have already determined the probability with which a new leader would be tempted to initiate a potentially avoidable war:

$$\beta(\alpha) = G(\gamma^*) - G(\gamma_*) = \gamma^* - \gamma_* \tag{16}$$

We have also determined the probability with which a new leader would gain reelection, $\Pi(\alpha)$. In this section, we use $\beta(\alpha)$ and $\Pi(\alpha)$ to determine the expected frequency with which a state will have a leader facing the war temptation, i.e. first term governments with poor economic records who have not already had their war handling characteristics revealed. We call this fraction $\sigma(\alpha)$, to denote the supply of conflict.

First, we determine the frequency with which a state has a first term leader. Let F_j

denote that a leader is in his first term at time period j, and $1 - F_j$ that a leader is not in his first term at period j (i.e. in his last term). Consider the Markov process describing whether a state has a leader who is in his first term. If a leader is currently serving his first term, the probability with which a leader will be serving his first term in the subsequent period is $1 - \Pi(\alpha) = PR(F_{t+1}|F_t)$. If the current leader is not serving his first term, since leaders may serve only up to two terms, this leader may not be reelected. Therefore, in this case, the probability with which a leader will be serving his first term in the subsequent period is one, i.e. $PR(F_{t+1}|1 - F_t) = 1$. Thus, the transition probability matrix indicating the term served by a state's leader is:

$$P = \begin{pmatrix} PR(F_{t+1}|F_t) & PR(1 - F_{t+1}|F_t) \\ PR(F_{t+1}|1 - F_t) & PR(1 - F_{t+1}|1 - F_t) \end{pmatrix} = \begin{pmatrix} 1 - \Pi(\alpha) & \Pi(\alpha) \\ 1 & 0 \end{pmatrix} \tag{17}$$

With this we can compute the unconditional frequency or stationary probability with which a leader will be serving a first term:

$$\phi(\alpha) = \frac{1}{1 + \Pi(\alpha)}. \tag{18}$$

Since only first term leaders face the war temptation, and of these first term leaders they only face this temptation with probability β, the frequency with which a state's leader will face the temptation to contribute to the supply of war is:

$$\sigma(\alpha) = \beta(\alpha)\phi(\alpha) \tag{19}$$

2.4 Equilibrium

To describe the equilibrium outcome for the world we assume that the world consists of a countable infinity of essentially identical states all of which are characterized by the properties described above for an individual state. We assume that the leaders' characteristics, γ and δ, are drawn independently from state to state, and, consequently, the reelection

and war supply temptation probabilities for one state are also independent of those for another—always taking as given the probability of a state facing unavoidable war, α. Consequently, application of the law of large numbers implies that the stationary probability for the supply of war for an individual state will equal the measure of states which will seek to supply war in any given period −− see Feldman and Gilles (1985). That is, the fraction of states who will seek to initiate potentially avoidable conflict in every period will be $\sigma(\alpha)$. The uncertainty at the individual state level regarding the reelection of a leader and his propensity to seek potentially avoidable conflict disappears in the aggregate.

To characterize the frequency of war equilibria, it needs to be recognized that when a state seeks to enter in a potentially avoidable conflict, it will require being matched with another state with which the conflict presumably has arisen. And unless the other state involved in the conflict was also actively seeking to engage in a potentially avoidable war, this conflict will appear unavoidable to that state. That is, one state's avoidable conflict may well be another state's unavoidable one.

The equilibrium condition describing the probability with which a state not seeking war may be forced into a conflict if σ fraction of states seek conflict is now determined. Denote the states seeking to initiate conflict 'seekers' and those who would rather avoid it 'avoiders.' Hence, with a fraction σ of seekers, the measure of avoiders in the world equals $1-\sigma$.

Now, by definition, α is the probability that a war 'avoider' country is engaged into a conflict by a war 'seeker.' In determining the equilibrium condition linking α and σ we need to specify the propensity with which seekers engage avoiders in conflict. For instance, if seekers somehow were to be matched only with other seekers, then the measure of 'avoiders' engaged in conflict, α, would equal zero, no matter how large σ happened to be. More generally, suppose that each seeker is matched with an avoider with probability ω and with another seeker with probability $1-\omega$. Then, the $\omega\sigma$ measure of seeker states will engage in conflict states among the $1-\sigma$ avoider states. Thus the probability of unavoidable war facing avoider states is:

$$\alpha = \frac{\omega\sigma}{1-\sigma} \;=\; \left\{ \begin{array}{c} \text{Fraction of Avoiders} \\ \\ \text{Matched with a Seeker} \end{array} \right\} \tag{20}$$

As already alluded to, if ω is zero, then 'avoiders' are never attacked and hence there is no fear of unavoidable war, namely $\alpha = 0$. At the other extreme, if seeker states were always matched with avoider states then $\omega = 1$ and the equilibrium condition would be $\alpha = \sigma/(1-\sigma)$.

Since countries are assumed to be *ex ante* identical our benchmark matching assumption is that 'avoider' and 'seeker' states are randomly matched. That is, for our equilibrium condition, we assume that the probability with which a seeker state is matched with an avoider state, ω, equals the fraction of avoider states in the world, $1-\sigma$. Then, $\omega = 1-\sigma$ and the equilibrium condition becomes:

$$\alpha = \sigma. \tag{21}$$

With this equilibrium condition, a world wide equilibrium of the frequency of war can easily be characterized as a pair of $\{\alpha, \sigma\}$ which satisfies the supply of war (19) and the equilibrium condition (21).[14]

3 Characterization of War Equilibria

Equations (19) and (21) form the basis of determining equilibria in our model with just democracies . The former is the individual country's probability of generating an avoidable war. This traces out, for a given probability of unavoidable war, the incentive compatible probability of starting an avoidable one. The latter is the general equilibrium condition which reflects that since one state's unavoidable war is another state's avoidable one, the two types of war must 'add up' across states.

3.1 Existence

In this sub-section we establish that Kant's idealistic equilibrium of perpetual peace always exists, but that other equilibria with positive war frequency may also prevail.

[14] As stated earlier, the equations for α and σ need to be compatible with $\overline{W}$. We explicitly calculate this in the Appendix.

Proposition 1 (The Kant Equilibrium) $\alpha = 0$ *is always an equilibrium.*

All proofs are in the appendix. Our first result is that Kant's equilibrium *is* feasible that is, a world populated only by democracies can sustain perpetual peace. As long as there is no external threat of war, voters will not be interested in a leader's war handling abilities, and therefore leader's will not be seeking conflicts to try and salvage their reelection prospects. The voters are simply not interested in this characteristic of a leader and, in equilibrium, their disinterest in war handling skills is self reinforcing since no wars occur.

However, while perpetual peace with democracy is shown to be feasible, it may not be the only feasible outcome and may not be stable. We turn to these issues next. First, we show that if leaders act as if they are completely selfish, $\rho > \overline{\rho}$, a war equilibrium may also be feasible. A central issue for this is the informational benefit to the electorate associated with the revelation of superior war handling ability. Intuitively, if the incidence of war is not expected to be costly regardless of the leader's ability, the electorate will rationally put much less emphasis on war handling abilities when considering reelection. Consequently the benefit associated with forcing the revelation of war handling ability is severely diminished for even completely selfish leaders. This diminishes the frequency of avoidable war supply and precludes the sustainability of positive war equilibria. A central question, therefore, is whether positive war equilibria exist if war is expected to be sufficiently costly. The following multiplicity condition (derived in the appendix) is sufficient and leads to our central war equilibrium existence result:

$$\lim_{\alpha \to 0} \frac{d\sigma}{d\alpha} = \frac{p\Delta\theta}{-1 + \theta + \sqrt{1+\theta}} > 1. \tag{22}$$

Proposition 2 (War Equilibrium Existence) *If* $\rho > \overline{\rho}$ *and* $p\Delta$ *is sufficiently high to satisfy (22) then an equilibrium with positive war frequency exists.*

The war equilibrium demonstrated in Proposition 2 is shown in Figure 1. The probability of unavoidable war, α, is measured on the horizontal axis while the supply of unavoidable war, $\sigma(\alpha)$ is measured on the vertical axis. The equilibrium condition, expression (21), is represented by the line drawn through the origin, which has a slope of one. If the expected

costs of war are sufficiently high (i.e. $p\Delta$ is large) then $d\sigma/d\alpha$ is greater than one when evaluated as $\alpha \to 0$ which coupled with the continuity of the supply schedule provides the multiple equilibria. This is demonstrated by the supply of war schedule labeled $\sigma^1(\alpha)$. By contrast, if the cost of war is not high enough, then the supply of war schedule falls below the equilibrium schedule as demonstrated with $\sigma^0(\alpha)$. Then, Kant's idealistic equilibrium is the unique equilibrium.

The preceding analysis is predicated on democratic leaders being quite selfish. Next, we examine the possibility of multiple equilibria in case leaders are partially benevolent. Assume that the multiplicity condition (22) is satisfied, so that if $\rho > \overline{\rho}$ the positive war equilibrium is known to exist. Then:

Proposition 3 (Partial Benevolence) *There exists $\underline{\rho} < \overline{\rho}$ such that multiple war equilibria exist only if $\rho \geq \underline{\rho}$. Further, for some $\rho \in [\underline{\rho}, \overline{\rho})$ multiple equilibria with positive war frequency exist.*

Figure 2 presents the essential elements of the model's equilibria when $\rho < \overline{\rho}$ and the expected costs of war are still high enough such that $d\sigma/d\alpha > 1$ for some α. The variables on both axes are the same as those in Figure 1 and the equilibrium condition is unchanged. There are two important cases to consider when $\rho < \overline{\rho}$. The first is the case where $\underline{\rho} < \rho < \overline{\rho}$. As $\rho < \overline{\rho}$ implies that $\gamma_* > \underline{\gamma}$ this means that for any level of α fewer governments will be tempted to seek out conflict and there will be a reduced supply of war. That is, the supply of war schedule falls everywhere below the one corresponding to the selfishness case, $\rho \geq \overline{\rho}$. Furthermore, for a range of α in the neighborhood of $\alpha = 0$, the supply of avoidable war will remain zero. This is due to the benevolence of incumbent leaders. When α is very small, benevolent leaders recognize that the welfare cost of war is too large relative to the benefit of demonstrating a potentially superior war handling ability. Hence they do not initiate avoidable wars. The information value of war increases with α, however, and for sufficiently high values the benefit of knowing δ becomes large enough for leaders to be tempted to initiate such wars. The result is illustrated in Figure 2 as the supply schedule $\sigma^2(\alpha)$. Compared to $\sigma^1(\alpha)$, the partial benevolence case of $\underline{\rho} < \rho < \overline{\rho}$ exhibits three steady states. With greater benevolence, $\rho < \underline{\rho}$, the supply of war drops further and

the multiplicity eventually vanishes, as illustrated with the supply schedule $\sigma^3(\alpha)$.[15]

3.2 Stability

We now turn our attention to the stability properties of the war equilibria examined above. Let $\hat{\alpha}$ be an equilibrium. To examine the local stability of an equilibrium $\hat{\alpha}$, it suffices to investigate whether the supply of war frequency will tend to restore the equilibrium if the actual frequency of war observed in the most recent period as well as the expected frequency of war in future periods are converge to the steady state $\hat{\alpha}$.[16]

Our first stability result concerns the equilibria described in Proposition 2 which obtain in the selfish leader case, $\rho > \overline{\rho}$.

Proposition 4 (Instability of Peace with Selfishness) *If $\rho > \overline{\rho}$ and the multiplicity condition (22) is satisfied, the Kant equilibrium is unstable.*

That is, with sufficiently selfish leaders, the existence of the positive war frequency equilibria described in Proposition 2 implies that the idealistic equilibrium is unstable. This startling result follows directly from the observation that the multiplicity condition we employ in Proposition 2 is complementary to the condition for stability for the perpetual peace equilibrium. Hence when $\rho > \overline{\rho}$ and the multiplicity condition holds, the Kant equilibrium is unstable! We now turn to the case of multiple equilibria with partial benevolence, $\underline{\rho} < \rho < \overline{\rho}$.

Proposition 5 (Stability of Peace with Partial Benevolence) *If $\underline{\rho} < \rho < \overline{\rho}$ then both the Kant equilibrium and a positive war equilibrium are stable.*

Returning to Figure 2, recall that with partial benevolence there are multiple equilibria with positive war frequency in addition to the idealistic/Kant equilibrium. As the supply of war is continuous in α and since $\sigma(1) < 1$, the largest $\hat{\alpha}$ must be such that $\frac{d\sigma(\hat{\alpha})}{d\alpha} < 1$. Furthermore, since $\beta(\alpha) = 0$ for a neighborhood near the origin, $\alpha = 0$ is also locally stable.

[15] There is also, of course, the knife-edge case $\rho = \overline{\rho}$. Then $\sigma(\alpha)$ is tangent to the equilibrium, for some $\hat{\alpha} > 0$, in which case there are just two equilibria, $\alpha = 0$ and $\alpha = \hat{\alpha}$. Also, we do not establish that the multiplicity obtains for *all* $\rho \in (\underline{\rho}, \overline{\rho})$. Possibly, multiplicity obtains in disconnected intervals in $(\underline{\rho}, \overline{\rho})$.

[16] That is, our notion of stability is that of asymptotic stability. See Weibull (1995) for a discussion.

Accordingly, in a world populated solely by democracies, one stable outcome is such that perpetual peace prevails in equilibrium. However, there are also other stable outcomes where peace does not prevail.

4 Appropriative Wars and Non-Democratic Regimes

The prior section investigated the signaling role of diversionary wars in a world populated with just democracies. Although this is an important limiting case, it is also of interest to examine the equilibrium frequencies of war that allow for two additional elements of realism. First, in addition to the presence of the diversionary conflict we examined thus far, and which are never beneficial for the citizens of a democracy, there may exist other wars that are appropriative in nature and potentially welfare improving. Second, the world is not populated solely by democratic governments and there exist non-democratic governments whose motivation for engaging in conflict may not be driven by diverting attention away from a poor economy. Below we consider the role of appropriative wars and non-democratic governments in the determination of the world wide frequency of war.

4.1 Appropriative Wars and Democracy

To introduce the role of appropriative wars, we assume that there are occasions when a government—independent of regime—is presented with an attractive opportunity for starting an appropriative conflict. With probability ψ, in every period, the leader of a state realizes an opportunity for such an appropriative war. These conflicts differ from the ones we examined thus far in that they present an additional net benefit to the state equal to ϵ per-person.

Thus, if the leader engages in such a war, the consumption of each individual citizen for that period changes from (1) to $c_t = \gamma_t + \delta_t + \epsilon$. For simplicity, we assume that the probability of being presented with an opportunity for an appropriative conflict, ψ, is independent over time, leader characteristics, leaders and countries. Further, the presence of such opportunities is perfectly clear to both leaders and citizens, and the appropriation benefits, ϵ, known.

The relevant question for our purposes is under what circumstances a democratic leader would seize an appropriative war opportunity. The answer depends critically on the size of ϵ and can be easily classified in two cases. One case obtains if the spoils from appropriative wars are so large that it would make such conflicts beneficial even for states whose leaders are not proven to be competent at war. This case is not interesting from the perspective of whether Kant's perpetual peace can be supported in equilibrium. By assuming the presence of welfare improving wars this scenario generates a positive frequency of war in equilibrium regardless of any other conditions, which would necessarily rule out Kant's perpetual peace.[17]

The second case obtains if appropriative war is beneficial only if the state is led to war by a democratic leader with demonstrated war handling competence. We concentrate our attention to this case. Clearly, if a leader knows that his war handling characteristic is $\delta = 0$ it will be to the benefit of the state to engage in such a conflict. Thus, appropriative conflicts will be initiated by leaders who are presented with such an opportunity after they have already been engaged in a conflict that revealed their superior war handling skills. The overall frequency with which a democratic state will contribute to the supply of war in this case is then:

$$\sigma^D(\alpha) = \beta(\alpha)\phi(\alpha) + \psi z(\alpha) \tag{23}$$

where $z(\alpha) \geq 0$ is the frequency of leaders who are currently serving their second term, and have war experience from their first term which revealed a good war handling ability. Here, of course, the first term on the right hand side of equation (23) continues to describe the diversionary motive as in equation (19). The second term is equal to the additional supply due to appropriative wars and has a number of interesting features. If $\alpha = 0$, then the supply of appropriative war is also zero, $z(0) = 0$. Recall that unless a state engages in a conflict, its leader cannot ascertain his war handling abilities. Thus, unless some leaders

[17]For example, consider the case where ϵ is so large that $\delta_t + \epsilon > 0$ regardless of the value of the leader's war handling ability, δ_t. In this case, since the war always yields net benefits the supply of war is bounded below by ψ and perpetual peace is no longer an equilibrium. Another case is such that ϵ is not large enough to outweigh the cost of war for incompetent military leaders, $\delta = -\Delta$, but is larger than the expected cost to be incurred by a leader of uncertain competence, $-p\Delta$, that is $\epsilon \in (p\Delta, \Delta)$. Again, for some first and second term leaders, this will be a sufficiently strong incentive for them to start an appropriative war, regardless of the value of α. Consequently, perpetual peace will never be an equilibrium.

are engaged in unavoidable conflicts during their first term, no leaders will have the war experience that might lead them into appropriative conflicts during their second terms. On the other hand, if $\alpha > 0$, some leaders will discover their superior handling skills during their first term and subsequently take advantage of the appropriative opportunities they might be presented with in their second term. Thus, for $\alpha > 0$, appropriative war supply by democracies is positive. However, the supply of appropriative war for democracies is always strictly less than ψ, regardless of α. This can be seen by noting the following. First, fewer than half of all leaders are in their second term in any period. Second, of these second term leaders, not all will have prior war experience, let alone one that revealed a good war handling ability.

A graphical illustration of the supply of war in the presence of an appropriation motive is shown in Figure 3. Essentially, appropriative conflicts rotate the supply schedule of war in a democratic world counterclockwise from the supply schedule σ^1 when $\psi = 0$ to the new schedule σ^4 when $\psi > 0$. It is worth noting that even though the appropriative motive we introduce is not strong enough to eliminate the Kant equilibrium, its presence re-enforces the possibility that positive war equilibria will exist.

4.2 Non-Democratic Regimes

Next, we consider the frequency of war under non-democratic regimes in order to provide some comparisons with our democratic world benchmark. To keep the analysis simple, we assume that non-democratic governments face a constant probability of remaining in office an additional period, independent of their economic and war handling abilities. This implies that, non-democratic leaders will have no incentive to and therefore will not engage in diversionary wars such as the avoidable conflicts some democratic leaders may engage in to increase the probability of their political survival. Gelpi (1997) provides supporting evidence for this claim. He finds that, in fact, democracies are more prone to use diversionary international uses of force to externalize domestic conflict as compared to authoritarian regimes. In contrast, he argues that authoritarian regimes tend not to externalize their domestic political problems but rather directly suppress domestic discontent via the military. In addition, Bueno de Mesquita, Morrow, Siverson and Smith (1998a) also find that the

length of office holding and the influence of adverse economic conditions are empirically quite different between democratic and non-democratic regimes. First, they report that over the past 200 years the average duration of office-holding by an autocrat is 20.7 years, while that for democratic leaders is 5.7 years. Second, and more central, they find that although an economic contraction increases by 50% the risk that a democratic leader will be removed from office, it actually reduces the risk that a non-democratic leader will be turned out of office.[18] Therefore, the evidence suggests that non-democratic regimes have little motivation to contribute directly to the supply of diversionary conflicts.

Non-democracies, however, are not bashful at engaging in appropriative conflicts. In fact, a fundamental difference between democracies and non-democracies often entails the way in which the net benefits from appropriative conflict are shared between leaders and citizens. Indeed, this difference was noted by Kant as quite important for understanding why perpetual peace cannot materialize in a non-democratic world.

> But under a constitution where the subject is not a citizen, and which is therefore not republican, it is the simplest thing in the world to go to war. For the head of state is not a fellow citizen, but the owner of the state, and a war will not force him to make the slightest sacrifice so far as his banquets, hunts, pleasure palaces and court festivals are concerned. Kant (1795, 1991), p. 101.

To capture this asymmetry in a simple manner we assume that the leader (and presumably the ruling elite that maintains his power base) usurps the benefits of appropriative wars ϵ, but does not incur the costs δ, which are borne by the people of the state. Under these simplifying assumptions it becomes evident that a non-democracy will start a war whenever its leader is presented with an appropriative opportunity. That is the supply of war by a non-democracy on average is: $\sigma^N = \psi$. From this, it is evident that if all countries were non-democracies then the equilibrium frequency of war would be exactly ψ.

[18] In a subsequent paper, Bueno de Mesquita, Morrow, Siverson and Smith (1998b), they provide a theoretical explanation for this intriguing finding. They argue that the greater number of people who have an institutional say in selecting leaders (selectors) versus the number of individuals the leader needs to stay in office (winners) will induce a norm of loyalty among selectors to the office holder as they fear being excluded from future ruling coalitions. Hence, leaders will exploit this and reduce their effort at producing goods that the public will enjoy. Accordingly, terrible economic performance can be sustained by non-democracies as they have a small equilibrium ratio of winners to selectors, unlike democracies which have a large equilibrium fraction of winners to selectors.

Note that the underlying net benefit to the country from an appropriative conflict, ϵ, is the same regardless of regime type. However, the distribution within a country of the benefits and costs of appropriative war depend on regime type. Importantly, this asymmetry will affect the propensity with which the two types of regimes start appropriative conflicts. Since all non-democratic leaders will seize the opportunity to start an appropriative conflict and not all democratic leaders will, the supply of appropriative conflicts will always be greater for non-democratic regimes than for democratic ones.

4.3 Peace in A More Democratic World?

A remaining question of interest is whether in a world populated by both democracies and non-democracies, the frequency of war will be smaller when the fraction of democracies is larger. If both democratic and non-democratic states co-exist with fractions λ and $1-\lambda$, respectively, then the total world supply of war is:

$$\sigma^W(\alpha) = \lambda\sigma^D(\alpha) + (1-\lambda)\sigma^N \tag{24}$$

where $\sigma^D(\alpha)$ is presented in equation (23) and $\sigma^N = \psi$.

To understand whether a more democratic world is more peaceful, we will again concentrate our attention to the case of selfish democratic leaders, $\rho > \overline{\rho}$, when the positive war equilibrium exists if the world is completely democratic. Then, when $\lambda = 1$ the supply of war is σ^4, as shown in Figure 3, which is now redrawn as σ^D in Figure 4. If all countries are democratic we have, of course, the Kant equilibrium and also the positive war equilibrium with frequency of war equal to $\bar{\sigma}^D$. If all countries are non-democratic, the supply of war is $\sigma^N = \psi$. Since the global supply of war is a weighted average of the two, the key for determining whether the global frequency of war falls or rises with increased democratization depends on whether $\bar{\sigma}^D$ is greater or smaller than ψ. Depending on the relative propensity for diversionary wars and appropriative opportunities, both cases are possible in our model.

To see this, consider the two limiting cases for the frequency of appropriative opportunities, ψ. As $\psi \to 0$, the diversionary motive for democracies becomes the only source of conflict so surely increased democratization raises the frequency of war. On the other

hand, since not all democratic leaders initiate war when presented with an appropriative opportunity whereas all non-democratic leaders do, if ψ were to approach one the supply of appropriative conflict by non-democracies would become the dominant source of war. Thus, given other parameters in the model, if ψ is sufficiently large we will have Case I: $\psi > \bar{\sigma}^D$, whereas if ψ is sufficiently small we will have Case II: $\psi < \bar{\sigma}^D$,

In Figure 4, we illustrate the global equilibrium for Case I, $\psi > \bar{\sigma}^D$. In this case, a completely non-democratic world, $\lambda = 0$, will have the highest frequency of war, shown as point N in the figure. With $\lambda \in (0, 1)$ the global war supply, shown as σ^W will fall between σ^N and σ^D with the equilibrium shown as point W. In this case, increased democratization will indeed reduce the equilibrium frequency of conflict. In Case II, however, with $\psi < \bar{\sigma}^D$, this would not obtain. An additional noteworthy feature that obtains in both cases is that in a partially democratic world, perpetual peace is not an equilibrium, a characteristic which accords well with historical observation. Only in the limit, as $\lambda = 1$, does the Kant equilibrium exist.[19]

5 Norms and Institutions

The model has so far established the existence and stability of equilibria characterized by perpetual peace and those with a positive frequency of war. While these results are helpful to understand the dynamics and incentives for voters and leaders within individual countries as well as in the aggregate, other factors may also influence the selection of the Kant equilibrium in the model—provided multiple equilibria exist. Below we consider the impact of norms and institutions on the model's equilibria.[20]

As pointed to in Proposition 4, when leaders are selfish then the no war equilibrium is unstable. This stability result, however, is based on a system of rational expectations whereby voters and leaders can flexibly alter their expectations about the probability of conflict. Assume that the world begins at this idealistic/Kant equilibrium and that the

[19]The case of partially selfish leaders is more complicated but delivers a similar conclusion to that described in the text for selfish leaders when the world is partially democratic. One interesting difference is that multiple equilibria can be constructed even if $\lambda < 1$, instead of just the limit case $\lambda = 1$.

[20]Importantly, we do not claim to endogenize these norms and institutions but merely explore what their influence would be on the equilibria we have identified through our model.

norm is that peace is to prevail perpetually. Here we consider a norm as being a rigid or sticky expectation regarding world behavior which would not immediately change in light of unexpected but transient events. If countries were then to observe a one-time incident of war, a norm regarding the peaceful resolution of disputes would provide a co-ordination device such that if all the countries believed that it was a one-time incident and continued to believe that the future probability of war was zero, then the idealistic/Kant equilibrium could still continue to be supported. Thus, if democratic countries adopt a norm that disputes will be solved without resort to violence, then these rather inflexible expectations may provide the necessary stability to the 'instability' of the no war equilibrium established in Proposition 4.

Another way to sustain the democratic peace would be to alter the domestic institutional framework underlying foreign policy decisions so as to involve voters directly – namely, decentralize the decision making process for war decisions more along the lines of a republic.[21] Unfortunately, the fundamental character of the foreign policy decision making process makes it likely that a representative democracy may be all that we can hope for in terms of domestic institutions. Private information, the complexity of foreign policy decisions, and the added time lag involved in decentralized decisions (e.g. voting on specific foreign policy issues) largely make a republic unattainable.

However, while altering domestic institutions may not be a feasible way of supporting an idealistic/Kant equilibrium, the creation of institutions between nations is more likely to bring about the Pareto optimal equilibrium.[22] More specifically, consider the existence of a credible institution such that a fraction of countries, μ, form an alliance with a threat to retaliate against a country with certainty if any member is attacked.[23] To demonstrate that in a world with just democracies a credible alliance is effective in stopping the threat of wars for members of the alliance from non-allied democratic government, consider the

[21]This point is brought out in Hess and Orphanides (1995). In a recent paper, Persson, Roland and Tabellini (1997) formally examine the benefits of the separation of powers for political accountability.

[22]It has been pointed out both by Kant (1795, 1991) and Tocqueville (1835, 1981) that democracies would be more inclined to form alliances and thereby bring about a world with fewer wars–essentially creating a 'separate peace'. Interestingly, Bueno de Mesquita and Lalman (1992) report that non-democratic allies are more likely to fight each other than if they were not allies.

[23]We assume that the alliance is such that its members do not attack one another, there is no free riding, and the alliance contractually obligates the countries to retaliate. For a general discussion of alliances see, among others, Bueno de Mesquita and Lalman (1992), Russett (1993) and Smith (1995).

following. If a democratic leader who seeks war attacks a country inside the alliance his probability of war next period is one, whereas if he attacks a country outside the alliance it is only α. Hence, a war seeker will not attack coalition countries but only non-coalition countries so that if the alliance is credible, the probability of war will be zero for members.

The observed implications of this form of alliance where there are insiders and outsiders is that, if the alliance is credible, the no war equilibrium will prevail for the members of the alliance—an outsider would rather attack an outsider than an insider. For countries outside the alliance, however, there will be no change in the international environment as there will still be seeker and avoider states in the same relative proportion as when we considered the entire world without alliances. Aggregating across insiders and outsiders, the world will have a lower frequency of war, $\hat{\alpha}(1-\mu)$, with the alliance versus $\hat{\alpha}$ without the alliance. The reduction in the frequency of conflict is entirely due to the reduction of conflict for alliance members.[24] The impact of alliances on the propensity for conflict also holds when there are non-democracies. If, as suggested by Kant (1795, 1991) and Tocqueville (1835, 1981) democracies are more inclined to form and join alliances, then non-democracies will tend to engage in appropriative conflicts only with each other.

The reduced frequency of conflict for countries within an alliance can naturally lead to a situation where all countries would want to belong to a credible coalition—such as has been attempted this century with the formation of the League of Nations and the United Nations. An all inclusive organization which credibly maintained the standard of protecting its democratic members would again bring the world towards the perpetual peace. Of course, the maintenance and origination of this type of institution would rely fundamentally on the organization's credibility, its incentive structure to reduce free riding on the public creation of peace, etc... These issues, while important, are unfortunately beyond the scope of this paper.[25]

Finally, while international institutions that encourage the peaceful resolution of dis-

[24]Notice that this does not eliminate a positive war frequency equilibrium but merely translates it to one with a proportionally smaller war frequency.

[25]A further enhancement to peace would be the international enforcement of a one term presidency. An individual state would not be willing to adopt this limitation on its own, given that others did not, as it would not lower its overall probability of war and it would not be able to retain leaders that it would prefer to. Again, the design of optimal constitutions is beyond the scope of this paper.

putes may bring about the democratic peace, so may international institutions that emphasize free trade and economic interdependence between nations. While economists do not typically list peace as one of the primary benefits of trade, the value of economic integration in this context should not be discounted. As Keynes (1919) pointed out at the close of the First World War, "A Free Trade Union, comprising the whole of Central, Eastern, and South-Eastern Europe, Siberia, Turkey, and (I should hope) the United Kingdom, Egypt and India, might do as much for the peace and prosperity of the world as the League of Nations itself." [p.249][26] Empirical support for the compounding effect that democracy and economic interdependence have on reducing the probability of conflict and crises between nations has been recently demonstrated in Oneal et al (1996) and Oneal and Russett (1997).

6 Conclusion

This paper presents a general equilibrium model of conflict based on a world populated by representative democracies. Based on the rational voter, partial equilibrium approach developed in Hess and Orphanides (1995), an individual country takes as given the probability of unavoidable conflict. An incumbent leader may initiate an avoidable conflict if doing so rationally diverts the electorate's attention from his inferior domestic handling of the economy towards the possibility that he may be good at handling foreign conflict. As a result, democratic states may be responsible for at least some foreign conflict. We endogenize the probability that a country faces an unavoidable conflict and examine whether war persists in equilibrium. In doing so we explore the conditions under which a world with democracies will have no war, the equilibrium associated with Kant's perpetual peace hypothesis.

The paper has four key findings. First, in a world with just democracies, the idealistic/Kant equilibrium always exists. Simply put, if a country faces no threat of war then its voters do not value war skills, and if this were true for all countries, then there is no incentive for a leader to start a welfare reducing war. Second, if democratic leaders are selfish in that they place a high weight on getting reelected and wars are expected to be

[26] Oneal and Russett (1997) state that, based on a late 20^{th} century interpretation of his argument for 'cosmopolitan law' as an ingredient for the perpetual peace, Kant also recognized this point.

costly, then additional equilibria will exist which have positive war frequency. Third, if democratic leaders are selfish then the Kant equilibrium may well be unstable in which case the prospects for peace in a democratic world would be rather dim. However, to the extent democratic leaders are at least partially benevolent perpetual peace is a stable equilibrium. Fourth, we demonstrate that a more democratic world will not necessarily be more peaceful. The outcome depends on the relative propensity for democratic countries to generate diversionary wars and the frequency with which appropriative war opportunities are exploited by democratic and non-democratic leaders. Furthermore, we find that the norms associated with the peaceful resolution of disputes and the presence of credible international institutions can have an important influence in the overall equilibrium and thus be crucial factors for the sustainability of perpetual peace.

While this paper has only examined conflict between states, conflict within states may be influenced by similar factors. Grossman (1991) provides a general equilibrium model of insurrections within a country to which factors such as the ones we highlight could be investigated. This also relates to the number and size of states which in our model we take as exogenous. Recently, Alesina and Spolaore (1995,1996) have created an economic model of 'secession'. Two findings of theirs, which are particularly relevant to our work, are that the process of democratization can lead to an increase in 'secessions' and that a decreased probability of international conflict actually increases the number of secessions. While Alesina and Spolaore only consider 'democratic' secessions, their emphasis on the endogeneity of the size of states is particularly important as not all break-ups are peaceful. This type of intranational conflict would be an additional avenue that will affect the likelihood that a world populated by just democracies can generate a perpetual peace. While these aspects of conflict are not incorporated into our model, they would likely reinforce the likelihood of positive war frequency equilibria. Maintaining a democratic perpetual peace, then, will be most likely only with increased international integration and co-ordination.

References

Alesina, Alberto and Enrico Spolaore, "On the Number and Size of Nations," *National Bureau of Economic Research*, Working Paper # 5050, May 1995.

————, "International Conflict, Defense Spending and the Size of Countries," *National Bureau of Economic Research*, Working Paper # 5694, August 1996.

Bueno de Mesquita, Bruce and David Lalman, *War and Reason*, Yale University Press, New Haven, CT, 1992.

Bueno de Mesquita, Bruce, Randolph M. Siverson, and Gary Woller, "War and the Fate of Regimes: A Comparative Analysis," *American Political Science Review*, 1993, *86*, 638-646.

Bueno de Mesquita, Bruce and Randolph M. Siverson, "War and the Survival of Political Leaders: A Comparative Study of Regime Types and Political Accountability," *American Political Science Review*, 1995, 89(4), 841-855.

Bueno de Mesquita, Bruce and Randolph M. Siverson, 'Explaining Democratic War Behavior," 1997, mimeo.

Bueno de Mesquita, Bruce, James D. Morrow, Randolph M. Siverson and Alastair Smith, 'Policy Failure and Political Survival: The Contribution of Political Institutions," 1998a, mimeo.

Bueno de Mesquita, Bruce, James D. Morrow, Randolph M. Siverson and Alastair Smith, 'Endogenous Political Institutions and the Survival of Leaders," 1998b, mimeo.

Cukierman, Alex, and Allan H. Meltzer, "A Positive Theory of Discretionary Policy, The Cost of Democratic Government and the Benefits of a Constitution," *Economic Inquiry*, 1986, *24*, 367-388.

DeRouen, Karl R., "The Indirect Link: Politics, the Economy, and the Use of Force," *Journal of Conflict Resolution*, 1995, *39*, 671-695.

Downs, George W. and David M. Rocke, "Conflict, Agency, and Gambling for Resurrection: The Principle-Agent Model Goes to War," *American Journal of Political Science*, May 1994, *38*, 362-380.

Doyle, Michael W., "Liberalism and World Politics," *American Political Science Review*, December 1986, *80*, 1151-1169.

Feldman, Mark and Christian Gilles, "An Expository Note on Individual Risk without Aggregate Uncertainty," *Journal of Economic Theory,* 35(1), February 1985, 26-32.

Forsythe. David P., "Democracy, War, and Covert Action," *Journal of Peace Research,*

29(4), 1992, 385-95.

Freedom House, *Freedom in the World: The Annual Survey of Political Rights and Civil Liberties*, various issues, New York, NY, Freedom House.

Garfinkel, Michelle R., "Domestic Politics and International Conflict," *American Economic Review*, December 1994, *84*, 1294-1309.

Garfinkel, Michelle R. and Stergios Skaperdas, "Introduction: Conflict and Appropriation as Economic Activities," in Michelle R. Garfinkel and Stergios Skaperdas (eds.), *The Political Economy of Conflict and Appropriation*, 1996, Cambridge University Press, Cambridge.

Gelpi, Christopher, "Democratic Diversions: Government Structure and the Externalization of Domestic Conflict," *Journal of Conflict Resolution*, April 1997, 41(2), 255-282.

Grossman, Herschel, "A General Equilibrium Model of Insurrections," *American Economic Review*, 1991, *81*, 912-21.

Hess, Gregory D. and Athanasios Orphanides, "War Politics: An Economic, Rational Voter Framework," *The American Economic Review*, September 1995, 85(4), 828-846.

Hess, Gregory D. and Athanasios Orphanides, "Economic Conditions, Elections, and the Magnitude of Foreign Conflicts," *The Journal of Public Economics*, 2000, forthcoming.

Kant, Immanuel, *Perpetual Peace*, 1795, reprinted in *Kant: Political Writings*, eds. Hans Reiss, translated by H.B. Nisbet, 1991, Cambridge University Press, Cambridge, UK.

Keynes, John Maynard, *The Economic Consequences of the Peace*, 1919, Macmillan and Co., London, UK.

Levy, Jack, 1989. The Diversionary Theory of War: A Critique. In: Midlarsky, M. (Eds.), The Handbook of War Studies, Unwin-Hyman, New York.

Lian, Bradley and James Oneal, "Presidents, the Use of Military Force, and Public Opinion," *Journal of Conflict Resolution,* 1993, *37*, 277-300.

Maoz, Zeev, and Nasrin Abdolali, "Regime Types and International Conflict," *Journal of Conflict Resolution*, 1989, 33(1), 3-35.

Morgan, T. Clifton and Sally H. Campbell, "Domestic Structure, Decision Constraints, and War: So Why Kant Democracies Fight?" *Journal of Conflict Resolution*, 1991, 35(2), 187-211.

Oneal, John R., Frances H. Oneal, Zeev Maoz and Bruce Russett, "The Liberal Peace: Interdependence, Democracy and International Conflict," *Journal of Peace Research*, 1996, 33(1), 11-28.

Oneal, John R. and Bruce Russett, "The Classical Liberals Were Right: Democracy,

Interdependence and Conflict," *International Studies Quarterly*, 1997, 41(2), 267-294.

Ostrom, Charles W. and Brian L. Job, "The President and the Political Use of Force," *American Political Science Review,* 1986, *80*, 541-566.

Persson, Torsten, Gerald Roland and Guido Tabellini, "Separation of Powers and Political Accountability," mimeo, March 1997.

Richards, Diana, T. Clifton Morgan, Rick Wilson, Valerie Schwebach and Gary Young, "Good Times, Bad Times and the Diversionary Use of Force: A Tale of Some Not-So-Free Agents," *Journal of Conflict Resolution*, 1993, 37, 504-535.

Rogoff, Kenneth, "Equilibrium Political Budget Cycles," *American Economic Review*, 1990, *55(1)*, 21-36.

Rogoff, Kenneth and Anne Sibert, "Elections and Macroeconomic Policy Cycles," *Review of Economic Studies*, 1988, *55*, 1-16.

Russett, Bruce, "Economic Decline, Electoral Pressure, and the Initiation of International Conflict," in *Prisoners of War*, ed. Charles S. Gochman and Alan S. Sobrosky, Lexington Books, Lexington, MA, 1990.

Russett, Bruce, *Grasping the Democratic Peace*, 1993, Princeton University Press.

Small, Melvin, and J. David Singer, *Resort to Arms: International and Civil Wars, 1816-1980,* Sage Publications, Beverly Hills, 1982.

Smith, Alastair, "Diversionary Foreign Policy in Democratic Systems," *International Studies Quarterly*, 1996, *40*, 133-153.

———**,** "Alliance Formation and War," *International Studies Quarterly*, 1995, *39*, 405-425.

Stoll, Richard, "The Guns of November: Presidential Reelections and the Use of Force, 1947-1982," *Journal of Conflict Resolution*, June 1984, *28(2)*, 231-246.

Tocqueville, Alexis de, *Democracy in America,* 1835, abridged 1981, New York, Random House.

Wang, Kevin H., "Presidential Responses to Foreign Policy Crises," *Journal of Conflict Resolution*, March 1996, *40(1)*, 68-97.

Weart, Spence R., *Never at War: Why Democracies Will Not Fight Each Other,* Yale University Press, New Haven and London, 1998.

Weibull, Jorgen W., *Evolutionary Game Theory*, MIT Press, Cambridge and London, 1995.

Table 1: Timing of Events for the Election of a New Leader

Term t: Election of a New Leader
1: γ of elected leader learned.
2: Leader takes the decision whether or not to seek an avoidable war.
3: Country is randomly matched with a potential opponent.
4: Engaged in war with probability one if the leader seeks an avoidable war in Step 2, and with probability α otherwise.
5: δ learned with a war and remains uncertain otherwise.
6: Consumption occurs, γ if no war, $\gamma + \delta$ if war. Leader realizes rents x.
7: Incumbent leader reelected or new leader elected.

Appendix

Proof of Proposition 1

If $\alpha = 0$, then by equations (5), (9) and (13) $\underline{\gamma} = \gamma_* = \gamma^*$. Therefore, using their definitions, $\beta = \sigma = 0$. Thus $\alpha = \sigma = 0$ is an equilibrium.

Proof of Proposition 2

A positive war equilibrium is an equilibrium such that $\sigma(\alpha) = \alpha$ for positive values of α. To evaluate such equilibria we first need to solve for the equilibrium of the problem in terms of α. To construct the equilibrium we need to find the solutions to $\overline{W}$, $\hat{\gamma}$, $\underline{\gamma}$ and γ^* as functions of α. The solution will satisfy equations (5), (7), and (9) and also the implicit equation for $\overline{W}$ which is defined as the unconditional expectation of a leader of characteristic γ. For our purposes it suffices to find the solution as α goes to zero. This is convenient because in that case as can be seen from equations (7) and (9), as α goes to zero, $\hat{\gamma}$ and $\underline{\gamma}$ are in the interior of $(0, 1)$ and in the limit equal γ^*. Hence, for small α the relevant equations become:

$$\underline{\gamma} = \overline{W}(1-\theta) = \gamma^* - \alpha p \Delta$$

$$\hat{\gamma} = \overline{W}(1-\theta) + \alpha\Delta = \gamma^* + \alpha(1-p)\Delta$$

Note that $\underline{\gamma} \leq \gamma_* \leq \gamma^* \leq \hat{\gamma}$. Since $\rho > \hat{\rho}$, however, $\gamma_0 < \underline{\gamma}$ and therefore by (13) $\gamma_* = \underline{\gamma}$. Consequently, when α is small so that $\hat{\gamma}$ and $\underline{\gamma}$ are in the interior we can express $\underline{\gamma}$ and $\hat{\gamma}$ in terms of just γ^* and characterize the equilibrium by solving for γ^* and $\overline{W}$.

To construct the equation for $\overline{W}$, we first need to define the welfare value of the public associated with alternative γ as follows:

For $\gamma \in [0, \underline{\gamma})$ such that sure loss with and without war:

$$W^1 = \gamma - \alpha p \Delta + \theta \overline{W}$$

For $\gamma \in [\underline{\gamma}, \gamma^*)$ such avoidable war chosen, leads to reelection with $(1-p)$

$$W^2 = \gamma - p\Delta + p\theta\overline{W} + (1-p)\theta(\gamma + \theta\overline{W})$$

For $\gamma \in [\gamma^*, \hat{\gamma})$ unavoidable war leads to reelection with $(1-p)$

$$W^3 = \gamma - \alpha p\Delta + \alpha p\theta\overline{W} + \alpha(1-p)\theta(\gamma + \theta\overline{W}) + (1-\alpha)\theta(\gamma - \alpha p\Delta + \theta\overline{W})$$

And finally, for $\gamma \in [\hat{\gamma}, 1]$ sure reelection even with war.

$$W^4 = \gamma - \alpha p\Delta + \theta(\gamma - \alpha p\Delta + \theta\overline{W})$$

Integrating over the appropriate regions of γ:

$$\overline{W} = \int_0^{\underline{\gamma}} W^1 dG + \int_{\underline{\gamma}}^{\gamma^*} W^2 dG + \int_{\gamma^*}^{\hat{\gamma}} W^3 dG + \int_{\hat{\gamma}}^1 W^4 dG$$

which together with

$$\gamma^* = \overline{W}(1-\theta) + \alpha p \Delta$$

characterize the equilibrium. Notice that since the distribution G is uniform, the integration in the equation above will provide a quadratic equation in γ^*. Only one of the two solutions, however, is feasible which yields the equilibrium:

$$\overline{W} = \frac{1 + \theta - \alpha \Delta p \theta - \sqrt{X}}{(1-\theta)\ \theta}$$

where

$$\begin{aligned} X &= 1 + \theta + 2\alpha\Delta^2 p^2 \theta - 2\,\alpha^2 \Delta^2 p^2 \theta - \alpha^3 \Delta^2 p \theta^2 - \alpha^2 \Delta^2 p^2 \theta^2 \\ &+ 2\,\alpha^3 \Delta^2 p^2\,\theta^2 + \alpha^2 \Delta^2 p^3\,\theta^2 - \alpha^3 \Delta^2 p^3\,\theta^2 \end{aligned}$$

With the solution at hand, using equations (16), (18) and (19) we determine the equilibrium σ as a function of α. Differentiation with respect to α and evaluation of the derivative in the limit yields:

$$\lim_{\alpha \to 0} \frac{d\sigma(\alpha)}{d\alpha} = \frac{p\Delta\theta}{-1 + \theta + \sqrt{1+\theta}}.$$

Notice that for sufficiently high $p\Delta$ this is greater than 1. Now observe that the equilibrium for $\overline{W}$ and γ^* is continuous in α. Hence, the function $\sigma(\alpha)$ is also continuous in α. Further, by Proposition 1, $\sigma(0) = 0$. Therefore, if $\lim_{\alpha \to 0} d\sigma(\alpha)/d\alpha > 1$, $\sigma(\alpha_1) > \alpha_1$ for some $\alpha_1 > 0$. But we also know that $\sigma(1) < 1$ (i.e. σ lies below the 45 degree line for $\alpha = 1$) since $\beta(1) < 1$ and $\phi(1) < 1$ so $\sigma(1) = \beta(1)\phi(1) < 1$.

Thus, by the intermediate value theorem there exists $\hat{\alpha} \in (0,1)$ such that $\sigma(\hat{\alpha}) = \hat{\alpha}$.

Proof of Proposition 3

To consider changes in the parameter ρ, it is convenient to view $\sigma(\alpha)$ as a function of both α and ρ, $\sigma(\alpha, \rho) = \sigma(\alpha; \rho, \text{other parameters})$. Now, for $\rho = \bar{\rho}$, choose a small $a_1 > 0$, such that $\sigma(\alpha, \bar{\rho}) > \alpha$ for $\alpha \in (0, \alpha_1)$. By construction, σ is continuous in both α and ρ. Thus, there exists $\rho_1 < \bar{\rho}$ such that for any $\rho_2 \in (\rho_1, \bar{\rho})$ there exists $\alpha_2(\rho_2) \in (0, \alpha_1)$ such that $\sigma(\alpha, \rho_2) > \alpha$ for $\alpha \in (0, \alpha_2(\rho_2))$. Thus, for some $\rho_2 < \bar{\rho}$, there exists $\alpha_3 > 0$ such that $\sigma(\alpha_3, \rho_2) > \alpha_3$. For this particular ρ, we can now construct two positive war equilibria.

For a high positive war equilibrium recall as in proposition 2 that $\sigma(1,\rho_2) < 1$. Since $\sigma(\alpha_3,\rho_2) > \alpha_3$, by the intermediate value theorem, there exists $\hat{\alpha}^H \in (\alpha_3, 1)$ such that $\sigma(\alpha^H,\rho_2) = \alpha^H$.

For a low war equilibrium, recall from the definition of $\bar{\rho}$ that if $\rho < \bar{\rho}$ then $\gamma_0 > \underline{\gamma}$. In that case,

$$\beta = \max\{0, \gamma^* - \gamma_0\}$$

Using the definitions of γ_0 and γ^*, note that

$$\gamma^* - \gamma_0 = \alpha p\Delta - h(\rho)$$

where

$$h(\rho) = \frac{p\Delta}{(1-p)\theta} - \frac{\rho x}{1-\rho}$$

and by construction, $h(\overline{\rho}) = 0$ and h is strictly decreasing in ρ. Thus, for any $\rho_0 < \bar{\rho}$ we can define $\alpha_0 > 0$ such that

$$\alpha_0 p\Delta = h(\rho_0)$$

noting that by construction, $\beta(\alpha) = 0$ for $\alpha \in (0, \alpha_0)$. As $\sigma(\alpha) = \beta(\alpha)\phi(\alpha)$, this also implies $\sigma(\alpha) = 0$ for $\alpha < \alpha_0$. Applying this argument to ρ_2, this implies that since $\rho_2 < \bar{\rho}$, there exists $\alpha_4 \in (0, \alpha_3)$. such that $\sigma(\alpha_4, \rho_2) = 0 < \alpha_4$. Since $\sigma(\alpha_3,\rho_2) > \alpha_3$, employing again the intermediate value theorem, there exists $\hat{\alpha}^L \in (\alpha_4, a_3)$ such that $\sigma(\alpha^L,\rho_2) = \alpha^L$. Since both α^L and α^H are non-zero, this establishes that for some $\rho < \bar{\rho}$, multiple equilibria with positive war frequency exist. To define $\underline{\rho}$, observe that when $\rho \to 0$, $\sigma(\alpha,\rho) = 0$ for all $\alpha \in (0,1]$. Thus, is ρ is sufficiently small, only the Kant equilibrium exists. $\underline{\rho}$ can thus be defined as the minimum of the set of ρ for which multiple equilibria exist. Since we already demonstrated that this set includes $\rho_3 < \overline{\rho}$, $\underline{\rho}$ is in the interior of $(0, \overline{\rho})$.

Proof of Proposition 4

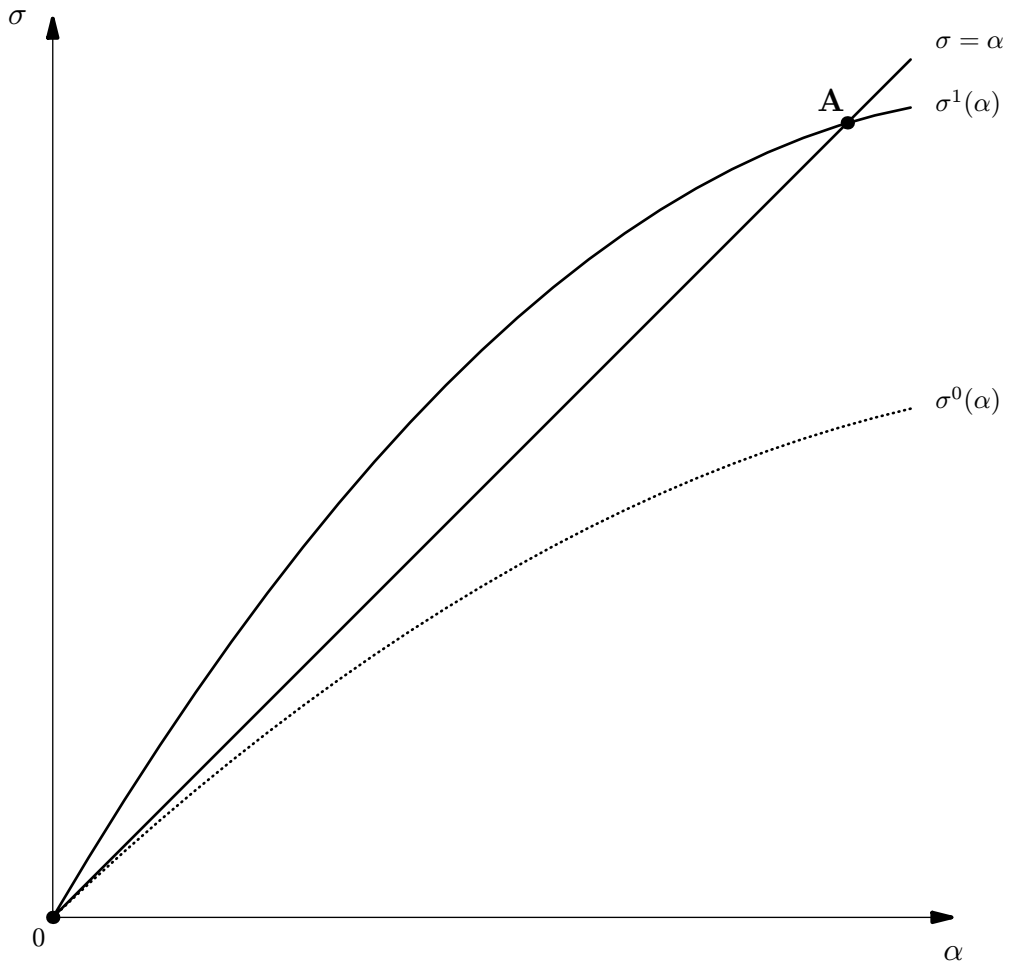
The multiplicity condition is $\lim_{\alpha\to 0} d\sigma(\alpha)/d\alpha > 1$. Stability of the Kant equilibrium requires $\lim_{\alpha\to 0} d\sigma/d\alpha < 1$. Thus, the multiplicity condition rules out stability for the Kant equilibrium.

Proof of Proposition 5

Since $\sigma(\alpha)$ is continuous in α and since $\sigma(1) < 1$, the largest $\hat{\alpha}$ must be such that $\frac{d\sigma(\hat{\alpha})}{d\alpha} < 1$; hence, it is locally stable. For the Kant equilibrium, we know from Proposition 3 that there exists α_0 such that $\sigma(\alpha) = 0$ for all $\alpha < \alpha_0$. So suppose we have a small deviation from the steady state, $\sigma_0 = \eta$ where $\eta \in (0, \alpha_0)$ Then, $\hat{\alpha}_0 = \eta$. But then $\hat{\sigma}_1 = \hat{\sigma}(\hat{\alpha}_0) = \hat{\sigma}(\eta)$ $= 0$ which is exactly the steady state. So the Kant equilibrium is also stable.

Figure 1

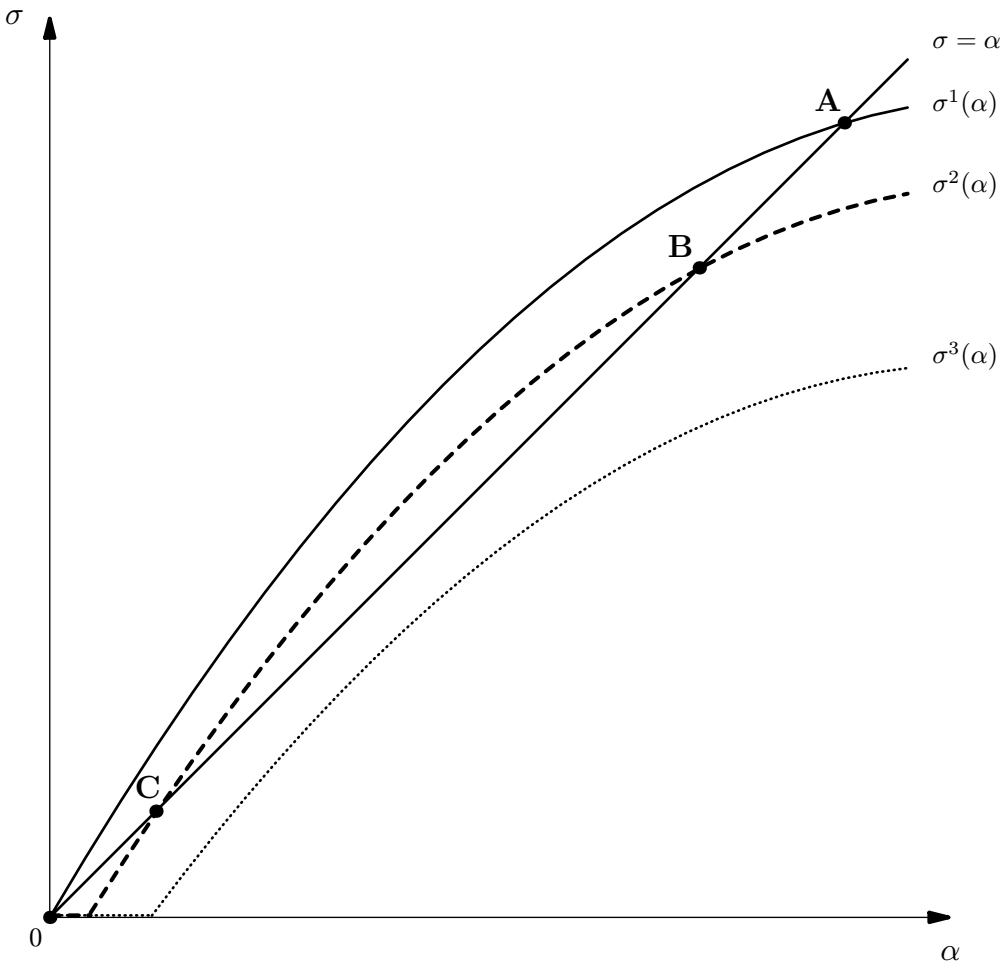
Multiplicity of War Equilibria



Note: The figure shows the equilibrium condition for war, $\sigma = \alpha$, and two supply schedules derived under the assumption that leader selfishness, ρ, exceeds $\bar{\rho}$. The lower line, $\sigma^0(\alpha)$, indicates the supply schedule when war costs are benign. In this case, $\alpha = \sigma = 0$ is the unique equilibrium of the model. The upper line, $\sigma^1(\alpha)$, indicates the supply schedule when war costs are high. Point A indicates the resulting positive war frequency equilibrium.

Figure 2

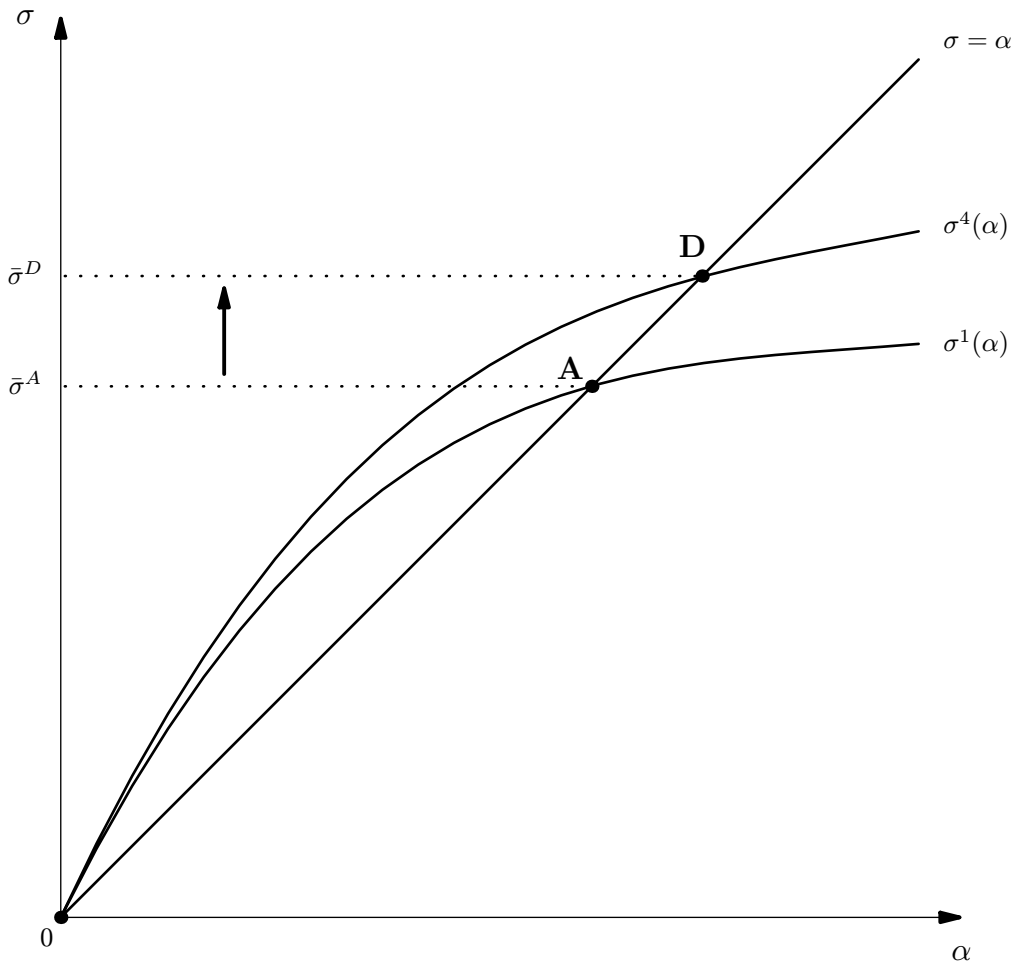
Leader Benevolence and Multiple War Equilibria



Note: The figure shows the equilibrium condition for war, $\sigma = \alpha$, and three supply schedules corresponding to different degrees of leader benevolence. The upper schedule, $\sigma^1(\alpha)$, is redrawn from Figure 1 and indicates the case equivalent to complete selfishness, $\rho > \bar{\rho}$. The lower line, $\sigma^3(\alpha)$, shows a case with leaders sufficiently benevolent, $\rho < \underline{\rho}$, such that only the perpetual peace equilibrium, $\alpha = \sigma = 0$ is supported. The intermediate case $\sigma^2(\alpha)$ exhibits three equilibria, with two, B and C, having positive war frequency.

Figure 3

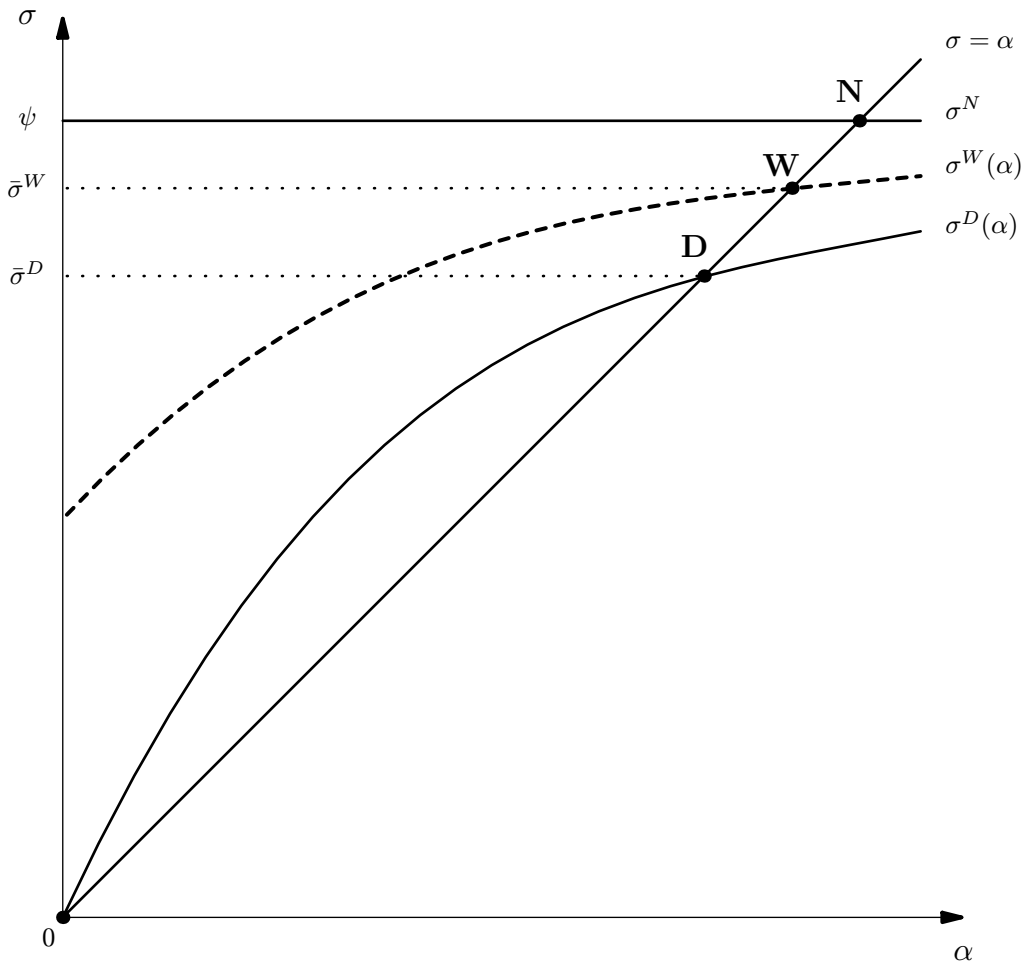
The Effect of Appropriative Wars



Note: The figure illustrates the effect of appropriative conflicts on the war supply with selfish democratic leaders. The baseline case with no appropriative motive corresponds to $\sigma^1(\alpha)$. With an appropriative motive, the supply rotates to $\sigma^4(\alpha)$ with a new positive war equilibrium at point D.

Figure 4

Global Equilibrium With Partial Democracy



Note: The supply schedules σ^D (redrawn from σ^4 in figure 3) and $\sigma^N = \psi$ denote the global supply of war when either all countries are democratic or all countries are non-democratic. The dashed line, σ^W indicates the global war supply when a fraction of all countries is democratic and another fraction is not. The resulting global equilibrium is at point W. The figure is drawn such that $\psi > \bar{\sigma}^D$ (Case I), so greater democratization reduces the frequency of war.