War as an Internal Indivisibility Problem

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Abstract

War is commonly conceived of as the result of a bargaining process between states. However, war also has redistributive consequences within a state: certain groups face disproportionate costs (e.g. likely conscripts), while other groups may accrue most of the benefits (military contractors, politicians, etc.). War should thus be viewed simultaneously as the result of a bargaining process between domestic groups. This paper presents a two-level game in which the relative importance of different domestic groups to a government can impact the likelihood of going to war, but only under certain conditions. In particular, a necessary condition for domestic distributive politics to matter for war onset is the existence of what this paper calls “internal indivisibility problems”- i.e. bargaining frictions between domestic parties. This also allows the model to produce a new explanation for why war may occur despite the fact that it is Pareto inefficient: inability to costlessly redistribute value domestically between war’s beneficiaries and the beneficiaries of any peaceful bargain.

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Introduction

In working to identify the factors that lead to war, international conflict scholars have often confronted a core puzzle: because war is costly, there should exist a negotiated outcome that all parties would prefer to war, and yet war regularly occurs (Fearon 1995). Indeed, given that war shrinks the size of the “pie” to be bargained over by destroying value, peace should create a dividend that could be allocated in such a fashion as to make everyone better off than they would be under any possible war outcome. A “rationalist explanation of war” must therefore go beyond explaining what one party hopes to gain from a conflict versus the status quo and explain why this bargaining process breaks down.

To explain this bargaining breakdown, Fearon (1995) initially posited three broad categories of factors: (1) informational problems; (2) commitment problems; (3) indivisibility problems.

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1 Computed via TeXCount. Includes references but not the title page.
More recently, international relations scholars have begun to address a fourth category of reasons for bargaining failure: agency problems.\footnote{Jackson and Morelli 2011 discusses this in a survey of the rationalist conflict literature, adding in a fifth category of “multilateral interactions”, which has yet to be explored in depth in the literature.}

Agency problems arise when the incentives of the decision makers responsible for entering a war - generally, the leaders of a country - differ from the incentives of the country as a whole. For instance, if politicians are responsive to the median voter, and the median voter experiences fewer costs from war than the country as a whole, we might expect such a country to exhibit “political bias” towards war (Jackson and Morelli 2007). Importantly, this creates space for domestic distributive politics - i.e. who wins and who loses from war within a country - to have an impact on war onset, as it may not matter if the country benefits as a whole from a peaceful bargain if the key constituencies do not.

Or does it? In this paper, I develop a model that demonstrates that domestic distributive politics can only have an impact on war onset under particular scope conditions. Specifically, in the absence of costs to redistributing value internally, the configuration of power and interests within a country should have no impact on war, since a state would still have an incentive to pursue an aggregate welfare maximizing bargain and then redistribute ex post. Indeed, it would not matter if a pro-war constituency is 10 times or 1000 times more influential than those who face the burdens of war, as the “inefficiency puzzle” at the heart of interstate conflict would simply have been relocated intrastate and left unresolved.

Instead, what is causally relevant in a rationalist account of war is not the agency problem alone, but a combination of distributive politics with what this paper calls “internal indivisibility problems”. Internal indivisibility problems are costs to redistributing value between domestic parties, or “bargaining frictions”. While indivisibility has generally been thought of in either/or terms, in which an issue is either literally divisible or not, indivisibility’s key characteristic is that the process of division creates costs that reduce the size of the pie being divided. “Literal” indivisibility, thought of this way, means a case where the costs of division exceed the total value of the issue. These costs could arise from a wide-variety of different factors, including political optics, policy constraints, or straightforwardly, deadweight losses and administration/enforcement costs from taxing and redistributing between parties.

When these internal indivisibility problems exist, the bargaining process between domestic parties becomes essential to understanding interstate conflict, given that the state-level actors responsible for interstate bargaining are highly unlikely to value every domestic group proportionately. Even without commitment problems or information asymmetries, war becomes possible if the government values the beneficiaries of conflict (e.g. military contractors, or elites with a larger stake in some contested policy) significantly more than those who are harmed most by that conflict (e.g. the soldiers). Furthermore, when these other issues exist, internal indivisibility problems exacerbate their effect, rendering commitment
problems more likely to generate conflict, and increasing the probability that war will result from miscalculations about capacities or resolve.

This paper develops a two-level game to demonstrate the importance of internal indivisibility problems in a rationalist account of war. In so doing, it also illustrates another important empirical implication: it is not only the distribution of power across groups that matters for war onset, but the distribution of internal indivisibility problems. Decisions about war and peace should be biased towards those groups from which value can be extracted relatively easily - e.g. easily taxable groups. Furthermore, while internal indivisibility problems are a necessary condition for domestic politics to impact war, it is not uniformly the case that they always increase the likelihood of war - increasing the costs of transferring value from those who benefit most from war actually makes war less likely.

Thus, this paper contributes to our understanding of the causes of conflict in two ways: (1) it clarifies the conditions under which domestic politics driven agency problems can be pivotal in war onset, demonstrating that distributive politics should have no role absent costs to redistributing value internally; (2) it derives new empirical implications about how the distribution of both power and internal indivisibility problems should relate to war onset, in a way that can be useful in explaining empirical patterns of conflict.

**The Domestic Distributive Politics of War**

What do we already know about the impact of domestic distributive politics on war? While there is an extensive literature examining linkages between domestic politics and security policy (e.g. Fearon 1994, Gowa 1998, Schultz 1998, Stam 1999, Ramsay 2004, Tarar and Levontoglu 2009, Tomz and Weeks 2013), this work has rarely addressed distributive politics per se, instead focusing on domestic audiences as a whole (e.g. by discussing “audience costs”), or on things like the impact of regime type on conflict propensity (Weeks 2008, 2012).

On the empirical side, a few exceptions exist. Fordham examines how conflicting economic interests may have shaped security policy during the Cold War, leading to, amongst other things, a difference in prioritization of conventional versus strategic forces between Republican and Democratic administrations (Fordham 1998, 2002). His other work has explored how economic interests might have influenced American decisions on whether to intervene in civil conflicts or international crises abroad (Fordham 2008).

Scheve and Stasavage (2010, 2012, 2016) provide the most comprehensive work to date linking war, distributive politics, and redistribution. They demonstrate that mass warfare has often been linked with increases in progressive taxation (e.g. estate taxes) as part of a broader bargain between elites - who often did not find themselves on the front lines of the conflict, and many of whom were accused of “war profiteering” - and the middle and lower classes who bore the most significant costs from the war. Viewed through the lens of this
paper's model, this would represent a case where the costs of transferring value from war's beneficiaries to those who experienced its burdens was relatively low, and decreased as a result of policy changes, thus creating and sustaining the domestic political conditions for war. It is therefore consistent with and arguably strongly supportive of one of the main conclusions of this paper's model.

On the theoretical side, there has long been a recognition of the need to model the interactions between domestic and international politics (see, for instance, Putnam's “two-level games”) (Putnam 1988), but the rationalist conflict literature has historically only addressed the possibility of distributive politics impacting war decisions obliquely. While Fearon (1995) acknowledged that “pathological domestic politics” might be important in explaining war onset, he left a more thorough exploration of this idea to other authors (Fearon 1995, p.409).

Jackson and Morelli (2007) represents a significant shift on this dimension in the literature, though it is also not primarily about domestic distributive politics. They discuss how the “political bias” of pivotal decision makers - whether these be politicians, the median voter, or others - may lead to war, arguing that “there are cases with a strong enough bias on the part of one or both countries where war cannot be prevented by any transfer payments” (Jackson and Morell 2007, p.1). This outlines an “agency problem” explanation for war, in which the incentives of the agents differ from the country as a whole they are representing.

While Jackson and Morelli do not focus on the sources of this agency problem, the argument nonetheless creates space for domestic distributive politics to have an impact on war onset. For example, it might be the case that pivotal decision makers will place less value on the costs of war than the general population if the groups that experience the burdens of war are less politically important than those that benefit. Taking up this line of argumentation, recent work has begun to examine the implications of domestic political institutions, including redistributive taxation, on political bias, thus providing the concept some microfoundations (Fearon 2008, Krainin and Ramsay 2018). Meanwhile, other work has examined the implications of political bias by building it into a dynamic model of crisis bargaining (Krainin and Slinkman 2017), and including it in a model linking conflict and international trade (Cooley 2019). Selectorate theory (Bueno de Mesquita et al. 2001) implicitly assumes a distributive politics driven agency problem, but does not link this to bargaining models of war - this linkage was made later in work by Goemans and Fey (2009).

This project contributes to this literature in two important ways. First, it demonstrates that distributive politics can only serve as a microfoundation for political bias with respect to war in the presence of costs to redistribution - otherwise the inefficiency puzzle remains, but at the domestic level. Second, it provides a new set of microfoundations for political bias,

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3This point is actually alluded to indirectly in an aside in a working paper by Fearon. He writes “it is assumed that non-elites cannot pay the leaders not to fight” in his characterization of Jackson and Morelli (2007) (Fearon 2008, p. 5).
demonstrating how differing weightings across groups and differing abilities to redistribute value from those groups interact to produce political bias in state-level agents.

It is worth noting that while this agency literature has begun to gain some traction, the default attitude amongst many towards a role for domestic politics in the bargaining model of war has been skepticism. Lake (2010), for instance, uses bargaining theory to explain the Iraq War, and in doing so discusses Halliburton, defense contractors, etc. acknowledging that “War clearly has domestic distributional consequences, but they most likely vary by conflict.” However, he goes on to argue that “it is highly unlikely that domestic interests were determinative in the war,” adding:

Given that bargaining theory is silent on exactly what a country’s preferred policy might be, differential policy preferences require no significant modifications. One can think of the national ideal point simply as the sum of different individual ideal points as aggregated through some set of domestic political institutions. So long as all individuals do not place a positive value on the act of fighting itself, or as long as influential groups do not have sufficiently high values for fighting, the central logic of bargaining theory that a mutually preferred negotiated solution must exist still holds. (Lake 2010, p.14)

Thus, the agency literature and Lake (2010) represent opposite ends of the spectrum. On the one hand, Lake (2010) assumes that the domestic aggregation process can occur in some simple fashion, wherein as long as individuals do not place positive value on fighting, a peaceful outcome will be preferred. But it is not at all obvious that this aggregation process will happen in an efficient manner: if a politician disproportionately values groups that could gain much from conflict but will experience few of the costs, then it may not matter if the domestic “losers” are harmed more in expectation than the winners are benefited, unless it is possible to transfer value from these prospective losers to the winners relatively easily.

Contrastingly, Jackson and Morelli assumes that if a decision maker has “biased” preferences relative to the country as a whole, they will be more likely to go to war, without considering the possibility that domestic redistribution could make a peaceful bargain preferable even for a biased agent. Thus, while Lake (2010) assumes that preferences can be aggregated in an efficient manner, Jackson and Morelli (2007) makes the opposite mistake by implicitly assuming that these transfers cannot occur, without discussing the conditions under which this might be the case.

This paper argues that domestic distributive politics can matter, but also identifies internal indivisibility problems as the linchpin of this conclusion. Without bargaining frictions, the process of aggregating domestic preferences should be efficient, such that no new analysis would be needed to accommodate a variety of domestic political institutions and preference distributions into the standard bargaining model of conflict. With bargaining frictions, however, it becomes useful to consider the potential configurations that might lead pivotal decision makers to prefer war to peace, despite the fact that war is costly.

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Indivisibility Problems and Side Payments

Indivisibility problems have usually been conceptually linked with the possibility of side payments in the literature. Indeed, in his original paper on rationalist explanations for war, Fearon writes “if states can simply pay each other sums of money or goods (which they can, in principle), or make linkages with other issues, then this should have the effect of making any issues in dispute perfectly divisible” (Fearon 1995, p. 389). Other work in international relations has demonstrated that states use issue linkage regularly as a means of weakening indivisibilities by permitting states to trade-off different priorities, so it is also clear that these side payments are empirically relevant (Davis 2004).

Consequently, whether or not a good or issue is indivisible depends on the availability of these side payments. However, there is no clear theoretical reason to believe side payments will always be available, or more importantly, that they will always be costless. Indeed, given that most transfers of value between groups entail costs (for instance, deadweight losses from taxation) we might expect costlessness to be the exception rather than the norm.

If side payments are available but often costly, with those costs varying continuously based on any number of factors, then it becomes clear that indivisibility should be viewed as a spectrum, rather than as an either/or issue, and that the key attribute that determines the level of indivisibility is the varying costliness of side payments. In line with this understanding of indivisibility, this paper characterizes these costs when they occur within a state between domestic parties as “internal indivisibility problems”.

The broader empirical literature on indivisibility problems has taught us much about the conditions under which dividing issues/territory might be expected to be especially costly, with a focus on factors such as sacred values, history, and ethnicity (Hasner 2003, Goddard 2005, Toft 2006, Fang and Li 2016). However, by focusing on situations where issues are so costly as to be literally indivisible, this work limits the breadth of a discussion that could otherwise more generally address costs to transferring value between parties. This paper frames internal bargaining frictions/costs to side payments as a kind of indivisibility problem in order to contribute to a broadening of this discussion.

Kennard, Krainin, and Ramsay (n.d.), in contrast, deals with a very similar issue as this paper, but at the level of interstate interaction, and without the indivisibility frame. They demonstrate that “the impact of power on cooperative outcomes is circumscribed in the presence of side payments”, noting that Coase Theorem (Coase 1960) implies that when side payments exist and are costless, “the outcome of bargaining [will be] invariant to the distribution of power among the bargaining parties” (Kennard et al. n.d., p. 10). This result is essentially identical to one of the core results about distributive politics produced in this paper, except that it is applied directly to bargaining between states rather than to the bargaining between domestic parties that indirectly affects interstate bargaining via the agency problem. However, Kennard et al. do not consider the possibility that side payments
might exist but be costly, so there is no interstate analog in their work to the results from this paper about varying the costs to these transfers.

**Costly Peace**

One final strand of the rationalist conflict literature that is related to this paper is the recent research on “costly peace” (Slantchev 2011, Coe 2011). This work notes that while war is a costly endeavor, peace can entail significant costs as well, in ways that either narrow the surplus that could be generated from a peaceful bargain or eliminate it entirely. Coe (2011) outlines three potential sources of costs from peace - (1) arming costs; (2) imposition of penalties and rewards; (3) distortionary costs arising from the expectation of predation - and discusses historical cases that he argues are better accounted for by costly peace than other rationalist explanations for war.

This paper connects naturally with this line of argumentation, in that it is also about costs that are incurred in the context of a peaceful bargain. However, it is substantially differentiated in two respects: (1) it addresses costs to redistribution between domestic parties, which reflects a new source of “costly peace” that has not been explored previously; (2) it focuses on cases where a positive surplus from peace still exists, but is not valued proportionately by a biased agent. Thus, one way of characterizing this paper is as a combination of three rationalist causes of war - (1) agency problems; (2) indivisibility problems; (3) costly peace - in a way that allows the paper to contribute to each of these subsets of the literature while identifying important conditionalities between them.

**The Model**

**Set-Up**

The model outlined in this paper is a simple distributive politics model - in which a government maximizes a weighted sum of utilities across two groups - embedded in a standard take-it-or-leave-it crisis bargaining model. There are two states, \( G \) and \( F \), and only \( G \)'s domestic politics is explicitly modeled - for simplicity, \( F \) is assumed to have “unbiased” and risk-neutral political preferences. \( G \) chooses an offer \( x \in [B, A] \subset \mathbb{R}^+ \) (with \( A > B \)) to make to state \( F \) as an alternative to conflict, and state \( F \) chooses to accept that offer, or to reject it and begin a war. Thus \( A \in \mathbb{R}^+ \) is the value of winning a war, while \( B \in \mathbb{R}^+ \) is the value of losing.

If the offer is rejected, state \( G \) wins the war with probability \( p \), loses with probability \( 1 - p \), and both countries pay cost \( c \in \mathbb{R}^+ \). However, for state \( G \), this war payoff is initially captured by domestic group 1. If the offer is accepted, then state \( G \) keeps value \( x \), but the peace payoff is initially captured by group 2.
This set-up implies very stark redistributive implications of war; group 1 initially gets all of the value from war, while group 2 gets all of the value from peace. However, the results of the model are robust to a wide-variety of more complicated specifications of war’s redistributive implications; the approach chosen is a simplification which helps to clarify the results. The key substantive assumption is that there is some underlying redistributive consequences of pursuing war or a peaceful bargain, which could arise from benefits accruing to certain groups from the activities of war (as with military contractors), the costs of an unfavorable policy disproportionately harming certain groups (e.g. with colonial merchants and the Tea Act, discussed in more detail later), or a differential assignment of costs from the war (e.g. when certain groups are disproportionately involved in fighting).

After the resolution of peace or war, state G can then redistribute value domestically between groups via taxation, but doing so may destroy some of the value of what is transferred, due to what this paper calls internal indivisibility problems. This loss of value will be captured in the model by “leaky bucket” parameters $\theta_1, \theta_2 \in [0, 1]$, which determine the percentage of the amount taken from one group that is ultimately consumed by the other group.

The timeline of the model is as follows:

1. State G makes offer $x$ to state F.

2. State F chooses whether to accept or reject. If they reject, the outcome is war, which state G wins with probability $p$.

3. After the resolution of peace or war, state G chooses tax rate $\tau_1$ or $\tau_2$ to redistribute value between the two domestic groups.

The tax rates $\tau_1, \tau_2 \in [0, 1]$ could mean redistributive taxation, but should more broadly be considered as any means by which the government could try to transfer value from one domestic party to another. State G’s simple objective function of weighted group utilities takes the following form:

$$U_G = \alpha U_1 + U_2 = \alpha \log(y) + \log(z)$$

Where $y, z \in \mathbb{R}^+$ stand in for whatever value is ultimately captured by group 1 and group 2 respectively. $\alpha \in \mathbb{R}^+$ reflects the weighting placed on group 1; when $\alpha > 1$, this implies that the beneficiaries of war are weighted more highly than those who disproportionately experience its burdens, whereas when $\alpha < 1$ war’s beneficiaries are weighted less. While none of the results in this paper depend on $\alpha$ being in either range, I am primarily concerned substantively with situations where $\alpha > 1$, such that war’s beneficiaries are more heavily

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4 As examples, one could include a weighting parameter which determines a percentage of the total value allocated to each group, with that weighting skewed towards the war benefitting group when conflict occurs, or one could set up a variant of the model where the benefits of war are always captured by group 1 but the costs of war are experienced by group 2.

5 These are similar to parameters that appear in Dixit and Londregan 1996, which are used in that paper to capture the degree to which core voters may be more easily “bought” by a ruling party seeking to secure reelection.
weighted by the representative political agent.

Each group’s utility function has natural logarithmic form, which implies that their forms are strictly concave (since \( \log(\cdot) \) is strictly concave). This builds in the assumption that there are decreasing returns to whatever value is claimed by each group, which is both substantively sensible, and helps to ensure that \( G \) will always choose \( \tau_1 \) or \( \tau_2 \) such that each group receives some positive value, i.e. that \( \tau_1 \) or \( \tau_2 \) will be at an interior solution.

Natural logarithms are also chosen so that state \( G \)’s objective function will have Cobb-Douglas form, which gives the solution of the model a convenient mathematical form.

This way of setting up the distributive politics model is extremely spare, but also very general. The model does not make any claims about what factors are likely to make one group more politically influential than another; instead, political weightings are determined exogenously and assigned to the different groups (via \( \alpha \)). While this approach endows the model with less power to generate precise empirical predictions about war and peace, it has the advantage of allowing the model to accommodate a wide-variety of domestic institutional features and political arrangements, thus ensuring that the model’s results cannot be tied to any particular assumptions about how the domestic political game unfolds.

Consider that different models of distributive politics tend to reduce, in their ultimate conclusions, to an assignment of weightings across groups. A Grossman-Helpman style lobbying contribution model, for instance, uses the contributions of groups to determine how much each is ultimately weighted relative to the welfare costs of providing them with specific benefits (Grossman and Helpman 1994, 2002). Swing or core voter models use specific features of the situation - such as political geography, ideology, or other characteristics - to determine which voters (and therefore ultimately which groups) will be considered most strongly by governments looking to maximize their chances of reelection (Cox and McCubbins 1986, Weibull 1987, Cox 2009). Similarly, work that focuses on collective action problems (Olson 1965, Bombardini and Trebbi 2012) would predict that groups that are better able to organize will be better able to extract concessions from the government, i.e. will be weighted higher by the government. Indeed, a developed literature in comparative politics is dedicated to addressing when certain groups will be weighted more highly than others, and this model does not look to contribute to this analysis; instead, the model simply characterizes the ways in which “internal indivisibility problems” will interact with these weightings to impact a government agent’s choices between war and peace.

**Analysis**

To solve for the Subgame Perfect Nash Equilibrium (SPNE) of the game, we use backwards induction, starting in Stage 3 of the model, i.e. the domestic redistributive politics stage. Consider that there are three possible outcomes that state \( G \) could face at this stage:

\[ \lim_{x \to 0} \frac{\partial \log(x)}{\partial x} = \infty. \]
1. Winning the war. Payoff of $A - c$ captured by group 1.

2. Losing the war. Payoff of $B - c$ captured by group 1.

3. Peaceful settlement. Payoff of $x \in (B,A)$ captured by group 2.

This leads to the following Stage 3 objective functions for state $G$.

1. $U_G(war,won) = a \log[(A - c)(1 - \tau_1)] + \log[(A - c)\theta_1]$

2. $U_G(war,lost) = a \log[(B - c)(1 - \tau_1)] + \log[(B - c)\tau_1\theta_1]$

3. $U_G(peace) = a \log[x\tau_2\theta_2] + \log[x(1 - \tau_2)]$

As mentioned earlier, $\tau_1, \tau_2 \in [0,1]$ are the tax rates on group 1 or group 2 respectively. The model is set up so that one group gets all of the value from a policy initially, with some of that value being redistributed after the fact; as a consequence, one of $\tau_1, \tau_2$ will necessarily be zero, since one group will have nothing to tax. Specifically, $\tau_1 = 0$ when a peaceful bargain is arrived at, while $\tau_2 = 0$ when war occurs.

$\theta_1, \theta_2 \in [0,1]$ are the costs to taxation, or the “internal indivisibility problems”; these are structured as “leaky buckets”, in which some of the value of the transfer is lost instead of consumed by the recipient party. This could mean something as straightforward as dead-weight losses to taxation, but they are intended to stand in for something more general, namely any loss of value generated by redistributing from one party to another. This could entail, for instance, political optics costs; as an example, a government agent might find it politically costly to directly extract funds from civilian soldiers in order to better compensate the management of defense contractors, even if this could be done with minimal allocative inefficiency.

Consequently, state $G$’s Stage 3 choice variable is $\tau_1$ after a war, or $\tau_2$ after a peaceful settlement. Solving for $\tau_1^*$ and $\tau_2^*$ produces:

$$\tau_1^* = \frac{1}{1 + a}, \quad \tau_2^* = \frac{\alpha}{1 + a}$$

Which we can substitute into the objective functions to obtain the following indirect utility functions:

1. $U_G^*(war,won) = a \log[(A - c)\frac{\alpha}{1+a}] + \log[(A - c)\frac{\theta_1}{1+a}]$

2. $U_G^*(war,lost) = a \log[(B - c)\frac{\alpha}{1+a}] + \log[(B - c)\frac{\theta_1}{1+a}]$

3. $U_G^*(peace) = a \log[x\frac{\theta_2\alpha}{1+a}] + \log[x\frac{1}{1+a}]$

\[\text{This is the standard solution when a problem has Cobb-Douglas form, but can easily be derived by taking first order conditions.}\]
We can now use these indirect utility functions to determine the following two expected utility functions for state $G$.

1. $G_w = EU_G(war) = p \left[ alog \left( (A - c) \frac{a}{1 + a} \right) + log \left( (A - c) \frac{\theta_1}{1 + \theta_1} \right) \right] + (1 - p) \left[ alog \left( (B - c) \frac{a}{1 + a} \right) + log \left( (B - c) \frac{\theta_1}{1 + \theta_1} \right) \right]$

2. $G_p(x) = EU_G(peace|x) = alog \left( x \frac{\theta_2}{1 + \theta_2} \right) + log \left( x \frac{1}{1 + \theta_2} \right)$

With these expressions in mind, we can move on to a consideration of the crisis bargaining model that occurs in the first two stages of the model. The game tree is as follows:

State $G$ has two possible equilibrium strategies. They can choose the $x^*$ defined implicitly by $A + B - x = pB + (1 - p)A - c$, i.e.:

$$x^* = pA + (1 - p)B + c$$

Which will make state $F$ indifferent between accepting and rejecting in Stage 2. Or state $G$ can choose any $x > x^*$ if they would prefer war to that peaceful resolution. They will choose this latter strategy if $G_p(x^*) < G_w$, in which case war will be the outcome.

We can now return to considering the domestic politics subgame (i.e. Stage 3 of the model). What happens if there are no internal indivisibility problems, i.e. if $\theta_1 = \theta_2 = 1$? This leads to the following proposition:

**Proposition 1.** Without internal indivisibility problems, the unique subgame perfect equilibrium of the model is a peaceful resolution in which state $G$ offers $x^* = pA + (1 - p)B + c$ and state $F$ accepts.

**Proof.** Following from the preceding discussion, we have these Stage 3 expected utility functions.
when $\theta_1 = \theta_2 = 1$.

$$G_W = p a \log \left( \frac{A - c}{1 + a} \right) + (1 - p) a \log \left( \frac{B - c}{1 + a} \right)$$

$$+ p \log \left( \frac{A - c}{1 + a} \right) + (1 - p) \log \left( \frac{B - c}{1 + a} \right)$$

$$G_P(x^*) = a \log \left( \frac{p A + (1 - p) B + c}{1 + a} \right) + \log \left( \frac{p A + (1 - p) B + c}{1 + a} \right)$$

Note that even if $c = 0$ (i.e. there are no direct costs to war), $\beta' > \beta$ and $\phi' > \phi$ by properties of concavity ($\log(\cdot)$ is a concave function). Substantively, this follows because the concave group utility functions induce risk-aversion in state $G$. This implies that $\beta' + \phi' > \beta + \phi$, and thus peace is preferred to war. Finally, with an offer of $x^*$, state $F$ is indifferent between accepting or rejecting (by construction), and thus accepting is a best response.

This result establishes that without internal indivisibility problems, peace is always the outcome when there are no other factors that might independently lead to war (e.g. information or commitment problems). This is regardless of the difference in weightings placed on different groups; indeed, it would not matter if war’s beneficiaries (group 1) were weighted 100 times more highly than group 2, since without the presence of some kind of internal redistributive frictions, states would choose the aggregate-value maximizing option and then redistribute ex post.

This is one of the core results of this paper’s model, so it is important to be clear about what contributes to this result, and how it differs from existing work. The international bargaining protocol used in this model - i.e. a take-it-our-leave-it offer, or ultimatum game - is both standard in the literature, and according to recent work, equivalent in terms of the outcomes produced to virtually any complex bargaining protocol, such that “crisis bargaining can be modeled as a simple ultimatum game with surprisingly little loss of generality” (Fey and Kenkel, forthcoming, p. 28). Research using this protocol and others like it has generically found that peace is the outcome without information or commitment problems; indeed, this is the core foundation of the “inefficiency puzzle” of war.

What this paper demonstrates is what happens as a result of incorporating an equally general domestic distributive politics model, in which the state-level agent simply has varying weightings on different groups, where those weightings could be generated from lobbying, specific institutional features, political geography, or any other number of other characteristics. The upshot is that disaggregating the state-level agent’s preferences in this way has no impact on the model’s outcome without the existence of internal indivisibility problems; thus, war cannot be a result of domestic distributive politics alone.
When these internal indivisibility problems exist (i.e. when \( \theta_1, \theta_2 \in (0, 1) \)), however, war becomes a possibility without the existence of information or commitment problems. This leads to the following proposition.

**Proposition 2.** Internal indivisibility problems can be a proximate cause of war. Furthermore, it is less likely that the conditions for war will be met when \( \theta_2 \) is higher, and more likely that the conditions for war will be met when \( \theta_1 \) is higher.

**Proof.** To start, since war occurs whenever \( G_W > G_P(x^*) \), the second part of this proposition is merely calculating \( \frac{\partial G_W}{\partial \theta_1} \) and \( \frac{\partial G_P(x^*)}{\partial \theta_2} \). This is straightforward, and produces the following:

\[
\frac{\partial G_W}{\partial \theta_1} = \frac{p}{(A-c)\theta_1^{1+\alpha}}(A-c)\frac{1}{1 + \alpha} + (1 - p)\frac{1}{(B-c)\theta_1^{1+\alpha}}(B-c)\frac{1}{1 + \alpha}
\]

\[
\frac{\partial G_P(x^*)}{\partial \theta_2} = \frac{\alpha}{x\theta_2^{1+\alpha}}(x)\frac{1}{1 + \alpha} = \frac{\alpha}{\theta_2}
\]

Since both of these are positive, it implies that higher \( \theta_2 \) makes it less likely that war will be chosen, while higher \( \theta_1 \) makes it more likely that war will be chosen.

For the first part of Proposition 2, given that Proposition 1 establishes that if \( \theta_1, \theta_2 = 1 \) peace is always the outcome, it is sufficient to demonstrate that there exist cases where war is preferred when \( \theta_1, \theta_2 \in (0, 1) \). Consider, for instance, a case where \( p = 0.5, A = 8, B = 2, c = 1, \alpha = 3, \theta_1 = 0.9, \theta_2 = 0.3 \). This gives \( x^* = 6 \). Substituting these values into the expected utility expressions above gives \( G_W = 3.02, G_P(x^*) = 2.02 \). Since in this case, \( G_W > G_P(x^*) \), the equilibrium is one where state \( G \) offers \( x > x^* \) and state \( F \) rejects the offer; the outcome is war. This establishes existence.

Thus, with internal indivisibility problems, it becomes possible for war to be the outcome of a standard crisis bargaining model without any commitment problems or information problems. Internal indivisibility problems are thus a proximate cause of war. However, this proposition also establishes that despite this, internal indivisibility problems are not always a contributing factor to war onset; in fact, when they make it more difficult to redistribute from war’s beneficiaries, they make it easier to sustain the conditions for peace.

This also leads to the following interesting lemma.

**Lemma 1.** The impact of \( \theta_2 \) on the likelihood that war is preferred by the state-level agent is higher when \( \alpha \) is higher.

**Proof.** From the proof of the last proposition, we have that \( \frac{\partial G_P(x^*)}{\partial \theta_2} = \frac{\alpha}{\theta_2} \), and thus it is the case that:

\[
\frac{\partial^2 G_P(x^*)}{\partial \theta_2 \partial \alpha} = \frac{1}{\theta_2}
\]

Which since this is positive, means that the impact of \( \theta_2 \) on \( G_P(x^*) \) is higher when \( \alpha \) is higher. Meanwhile, \( \alpha \) is not in the expression for \( \frac{\partial G_W}{\partial \theta_1} \), so it does not impact that half of the \( G_W > G_P(x^*) \) comparison.

\[\square\]
This is substantively straightforward; as the importance of “compensating” the group that would otherwise push for war instead of a peaceful resolution increases, the ability to do this becomes more important. This suggests, roughly, that societies with highly unequal distributions of power across groups will be more heavily impacted by internal indivisibility problems.

Finally, conditional on the existence of these internal indivisibility problems, domestic distributive politics becomes an important factor in whether war occurs or not, leading to the following proposition:

**Proposition 3.** If internal indivisibility problems exist, the relative weightings placed on group 1 and group 2 by state $G$ can determine whether or not war occurs. Specifically, higher $\alpha$ will increase the likelihood of war whenever group 1 receives less than their certainty equivalent for war in a peaceful bargain.

**Proof.** To determine the impact of $\alpha$ on the likelihood of conflict, note that conflict occurs whenever:

$$G_W > G_P(x^*) \iff G_W - G_P(x^*) > 0$$

So to determine the impact of $\alpha$ on war, we need to determine its impact on $W_S = G_W - G_P(x^*)$, where $W_S$ denotes the “surplus” captured by $G$ from war. Thus, we have:

$$\frac{\partial G_W}{\partial \alpha} = \frac{\partial G_W}{\partial \alpha} - \frac{\partial G_P(x^*)}{\partial \alpha}$$

So to sign this, we need to compute two partial derivatives. We start with:

$$\frac{\partial G_P(x)}{\partial \alpha} = \log \left( \frac{x \theta_2 \alpha}{1 + \alpha} \right) + \frac{\alpha}{x \theta_2 \alpha} \frac{1}{(1 + \alpha)^2} + \frac{1}{x \theta_2 \alpha} \frac{-x}{1 + \alpha}$$

$$= \log \left( \frac{x \theta_2 \alpha}{1 + \alpha} \right) + \frac{1 + \alpha}{(1 + \alpha)^2} - \frac{1 + \alpha}{(1 + \alpha)^2}$$

$$= \log \left( \frac{x \theta_2 \alpha}{1 + \alpha} \right)$$

And then compute:

$$\frac{\partial G_W}{\partial \alpha} = p \left[ \log \left( \frac{A - c}{1 + a} \right) + \frac{1}{1 + a} - \frac{1}{1 + a} \right] + (1 - p) \log \left( \frac{(B - c) \alpha}{1 + a} \right) + \frac{1}{1 + a} - \frac{1}{1 + a}$$

$$= p \log \left( A - c \right) + \frac{1}{1 + a} + (1 - p) \log \left( B - c \right) - \frac{1}{1 + a}$$

We can substitute in for the equilibrium $x^*$, but in this case it is somewhat clearer to leave the value as $x$. Therefore, $\frac{\partial G_W}{\partial \alpha}$ is simply the (unweighted) expected utility of war for group 1, while $\frac{\partial G_P(x)}{\partial \alpha}$ is the utility obtained (with certainty) from a peaceful bargain (note that $\frac{x \theta_2 \alpha}{1 + \alpha}$ is the value captured by group 1).

So in order for $\frac{\partial W_S}{\partial \alpha} > 0$ (the condition for $\alpha$ to increase the likelihood of war), it is not sufficient that group 1 receive an equivalent expected value from war, they need to also be paid a risk premium, otherwise peace is preferred.
Proof. The first part of this is just simplifying the expression for \( \theta_0 \). So, for instance, if \( G_W = 0.90 \) and \( G_P(x^*) = 1.05 \). Since \( G_P(x^*) > G_W \), state G offers \( x^* \) and state F accepts; the outcome is peace. Thus, we have demonstrated that simply by increasing the weighting placed on group 1 - the group that benefits most from a war outcome - the equilibrium outcome can change from peace to war.

Proposition 3 establishes that domestic distributive politics can indeed matter for war onset; but only conditionally. Without internal indivisibility problems, Proposition 1 establishes that domestic politics can have no impact on whether war occurs or not. Indeed, in order for domestic distributive politics to matter, \( \theta_2 \) needs to be low enough that group 1 receives not only less than their on average returns from war, but less than their certainty equivalent, which given that they are risk averse (as implied by the concavity of \( \log() \)), may be significantly lower than their average return from war.

We can also put some additional structure on when war will be chosen over peace with the following lemma.

**Lemma 2.** War will occur whenever the following condition is met:

\[
G_W - G_P(x) = (a + 1)(p \log(A - c) + (1 - p)\log(B - c) - \log x) + \log(\theta_1) - a\log(\theta_2) > 0
\]

Furthermore, a necessary (but not sufficient) condition for war is:

\[
\log(\theta_1) - a\log(\theta_2) > 0
\]

Proof. The first part of this is just simplifying the expression for \( G_W - G_P(x) \).

\[
G_W = p \left[ a\log\left(\frac{A - c}{1 + a}\right) + \log\left(\frac{A - c}{1 + a}\right)\right] + (1 - p) \left[ a\log\left(\frac{B - c}{1 + a}\right) + \log\left(\frac{B - c}{1 + a}\right)\right]
\]

\[
= (1 + a)[p\log(A - c) + (1 - p)\log(B - c)] + a\log(a) + \log(\theta_1) - (1 + a)\log(1 + a)
\]

\[
G_P(x) = a\log\left(x\frac{\theta_2}{1 + a}\right) + \log\left(x\frac{1}{1 + a}\right)
\]

\[
= (1 + a)\log(x) + a\log(\theta_2) + a\log(a) - (1 + a)\log(1 + a)
\]

\[
G_W - G_P(x) = (a + 1)(p\log(A - c) + (1 - p)\log(B - c) - \log x) + \log(\theta_1) - a\log(\theta_2)
\]

And as discussed before, war occurs whenever \( G_W - G_P(x) > 0 \). Now note that if \( x^* = pA + (1 - p)B + c \), then the first part of the expression will be negative by the concavity of \( \log() \):

\[
(a + 1)(p\log(A - c) + (1 - p)\log(B - c) - \log[pA + (1 - p)B + c]) < 0
\]

So war will only occur if the second part of this expression is sufficiently positive to compensate. □

Here one must be careful to note that given that \( \theta_1, \theta_2 \leq 1 \), it is also the case that \( \log(\theta_1), \log(\theta_2) \leq 0 \). So, for instance, if \( \theta_1 = \theta_2 < 1 \) and \( a > 1 \), then \( \log(\theta_1) - a\log(\theta_2) > 0 \), though whether or not it will be sufficiently positive to lead to war depends on the magnitude of \( A, B, c, \) and \( p \). This draws attention to the importance of both the relative ability to redistribute from each group and the weightings on each group in determining whether war occurs.
Introducing Uncertainty

We can now consider a variant of the model with incomplete information, which is useful for two important reasons. First, it demonstrates how internal indivisibility problems can interact with information asymmetries to produce war, allowing us a better understanding of the role these bargaining frictions play in a more complete account of the causes of conflict. An especially valuable insight from this approach is that internal indivisibility problems can matter even when they are not the sole or primary cause of conflict, and can indeed be pivotal even when they are relatively small, or in cases where the balance of power across groups is not especially disproportionately skewed.

Second, by providing a baseline model in which there is a positive probability of war, it becomes possible to speak more coherently about comparative statics, in that we can assess directly the impact of different parameters on this probability of war. The comparative statics results from Propositions 2 & 3 rely on discussing the impact of parameters on the “likelihood” that certain conditions are met, despite the fact that each condition is a binary and thus each is either met or not.

In this variant of the model, we assert that the costs of war to state $G$ and state $F$ are different (call these $c_G \in \mathbb{R}^+$ and $c_F \in \mathbb{R}^+$). State $F$ observes its cost ($c_F$) but state $G$ does not. State $G$’s cost ($c_G$) is common knowledge. $c_F$ is absolutely continuously distributed $c_F \sim f(c)$ on some closed interval $[c_F^-, c_F^+]$. This structure is represented by the following game tree:

![Game Tree Diagram]

The important difference between this and the earlier variant of the model is that the uncertainty induces a risk-return trade-off for state $G$, wherein even without internal indivisibility problems war may be the outcome if state $G$ offers state $F$ a lower amount in the hope
that state $F$’s costs are high enough that they will accept it anyway, but state $F$’s costs turn out to be low enough that they prefer war to that offer. State $F$’s best response is to accept if and only if:

$$A + B - x \geq pB + (1 - p)A - c_F$$

$$\iff x \leq pA + (1 - p)B + c_F$$

This allows us to define the probability of war and peace as a function of any given $x$ thusly:

$$Pr(war) = Pr[c_F \leq x - pA + (1 - p)B] = \int_{c_F}^{x - pA + (1 - p)B} f(c)dc$$

$$Pr(peace) = 1 - Pr[c_F \leq x - pA + (1 - p)B] = 1 - \int_{c_F}^{x - pA + (1 - p)B} f(c)dc$$

Note that since the upper bound of these integrals is increasing in $x$, it must be the case that $\frac{\partial Pr(war)}{\partial x} \geq 0$ and $\frac{\partial Pr(peace)}{\partial x} \leq 0$.

Following from this, we can write the expected utility for state $G$ as:

$$EU_G(x) = G_P(x)Pr(peace) + G_W(1 - Pr(peace))$$

Which allows us to characterize the optimal $x^*$ when it is an interior solution (i.e. is located on $(B, A)$) with the following first order condition.

$$\frac{\partial EU_G}{\partial x} = (G_P(x) - G_W) \frac{\partial Pr(peace)}{\partial x} + \frac{\partial G_P(x)}{\partial x} Pr(peace) = 0$$

We have a corner solution of $x^* = B$ when $\frac{\partial EU_G}{\partial x}(x = B) < 0$, since this means that at the lowest possible offer $G$’s expected marginal benefit to increasing the offer is negative. A corner solution of $x^* = A$ is obtained when, conversely, $\frac{\partial EU_G}{\partial x}(x = A) > 0$, which suggests a positive marginal benefit to increasing the offer at the highest possible offer.

If we are instead at an interior solution, we can use the above expression to determine the properties of the optimal $x^*$. First, note that:

$$\frac{\partial G_P(x)}{\partial x} = \frac{\alpha}{x} + \frac{1}{x} > 0$$

Following from earlier results. So we can sign the different parts of the earlier first order condition as follows:

$$\frac{\partial EU_G}{\partial x} = \underbrace{(G_P(x) - G_W)}_{?} \frac{\partial Pr(peace)}{\partial x} \underbrace{< 0}_{\geq 0} + \frac{\partial G_P(x)}{\partial x} Pr(peace) = 0$$

Clearly, state $G$ will choose an $x$ in equilibrium such that $G_P(x) > G_W$ if we are at an interior solution; if the war payoff is higher than the peace payoff, then nothing is being risked by
demanding a higher $x$. This expression helps clarify that the main trade-off facing state $G$ when deciding whether to claim a higher $x$ is between increasing the $G_P(x)$ payoff they receive in a peaceful outcome, and the higher likelihood that war may occur if state $F$’s costs turn out to be higher than hoped.

Without solving explicitly for $x^*$, we can determine the sign of the relevant comparative statics by taking additional partial derivatives and then invoking results from monotone comparative statics, as outlined by Milgrom and Shannon (1994). By demonstrating the impact of parameter changes on the equilibrium $x^*$, we can also determine the impact these parameter changes have on the equilibrium likelihood that war occurs, given that we have established that $\frac{\partial Pr(war)}{\partial x} \geq 0$.

For instance, consider the parameter $\theta_2$, which characterizes the ease with which the pro-peace domestic group can be taxed. We start by deriving the following expression:

$$\frac{\partial^2 EU_G}{\partial x \partial \theta_2} = \frac{\partial G_P(x)}{\partial \theta_2} \frac{\partial Pr(Peace)}{\partial x} + \frac{\partial^2 G_P(x)}{\partial x \partial \theta_2} Pr(Peace) = 0$$

We can show that $\frac{\partial^2 G_P(x)}{\partial x \partial \theta_2} = 0$ easily by taking the relevant partial derivative of the earlier derived expression for $\frac{\partial G_P(x)}{\partial x}$. We can also compute:

$$\frac{\partial G_P(x)}{\partial \theta_2} = \alpha \theta_2$$

Which allows us to sign the different parts of the earlier expression:

$$\frac{\partial^2 EU_G}{\partial x \partial \theta_2} = \frac{\partial G_P(x)}{\partial \theta_2} \frac{\partial Pr(Peace)}{\partial x} < 0$$

$\frac{\partial^2 EU_G}{\partial x \partial \theta_2} < 0$ is a sufficient condition for submodularity, so by monotone comparative statics, this establishes the following proposition:

**Proposition 4.** $x^*$ is decreasing (weakly) in $\theta_2$, i.e.:

$$\frac{\partial x^*}{\partial \theta_2} \leq 0$$

Which further implies that in equilibrium:

$$\frac{\partial Pr(war)}{\partial \theta_2} \leq 0$$

Proof in preceding discussion. This demonstrates that being better able to tax the “winners” of peace makes peace more likely, by reducing the equilibrium $x^*$, which in turn reduces the
probability that the offer is rejected, which would result in war.

To reemphasize, ability to “tax” is considered by this paper more broadly as the ability to redistribute value, and the costs to “taxation”, or internal indivisibility problems, need not only be about things like deadweight losses or enforcement costs, but could include political optics, norms, distrust between groups, or any other number of characteristics. In many cases, it may be that taxation of peace’s winners may be technically feasible, but very costly for reasons that go beyond the scope of this model.

However, if one interprets this as about literal taxation, this result stands in contrast with work that suggests that fiscal capacity (i.e. the ability to raise tax revenues) is likely to increase the likelihood of war by improving the capacity for a state to engage in it (Besley and Persson 2008, Dincecco and Prado 2012, Queralt 2018). In this model, because taxation can also serve a redistributive purpose, the relationship is more ambiguous.

We can compute similar comparative statics for $\theta_1$, i.e. the ability to tax war's beneficiaries, which leads to the following proposition:

**Proposition 5.** $x^*$ is increasing (weakly) in $\theta_1$, i.e.:

$$\frac{\partial x^*}{\partial \theta_1} \geq 0$$

Which further implies that in equilibrium:

$$\frac{\partial Pr(war)}{\partial \theta_1} \geq 0$$

**Proof.** First, we compute:

$$\frac{\partial G_W}{\partial \theta_1} = \frac{p}{\theta_1} + \frac{1-p}{\theta_1} = \frac{1}{\theta_1} > 0$$

And then compute the cross-partial:

$$\frac{\partial^2 EU_G(x)}{\partial x \partial \theta_1} = -\frac{\partial G_W}{\partial \theta_1} \frac{\partial Pr(Peace)}{\partial x} \geq 0$$

Which is a sufficient condition for supermodularity. Thus, by monotone comparative statics we have:

$$\frac{\partial x^*}{\partial \theta_1} > 0$$

Which since $\frac{\partial Pr(war)}{\partial x} \geq 0$ implies that in equilibrium:

$$\frac{\partial Pr(war)}{\partial \theta_1} \geq 0$$

---

8To be clear, this work largely reverses the causal arrow in talking about the effect of war on fiscal capacity. However, implicit in this argument is the conjecture that higher fiscal capacity is an important part of sustaining the conditions for conflict.
This establishes that being better able to tax the winners of war will make war more likely. A key thing to note about this result is that it implies that internal indivisibility problems are not always "bad", as evaluated from the perspective of someone who wishes to reduce the incidence of war. While they are a necessary condition for war in the model without uncertainty, in this version of the model there is a positive probability of war stemming from incomplete information, and whether or not internal indivisibility problems raise or lower the probability of war depends on which parties they affect.

Finally, we can compute the comparative statics for \( \alpha \), i.e. the weight state \( G \) places on the group that benefits most from war. This gets at the heart of the question of whether "pathological domestic politics" - e.g. a state’s disproportionate weighting of war-benefiting groups over others - can increase the likelihood of war. Surprisingly, this turns out to have an ambiguous effect in this version of the model, as summarized in the following proposition:

**Proposition 6.** The impact of \( \alpha \) on \( x^* \) is ambiguous. It is negative whenever:

\[
\frac{\partial \log \left( (A - c) \frac{\alpha}{1 + \alpha} + (1 - p) \log \left( (B - c) \frac{\alpha}{1 + \alpha} \right) - \log \left( x \theta_2 a \frac{\alpha}{1 + \alpha} \right) \right)}{\partial x} \log \left( (A - c) \frac{\alpha}{1 + \alpha} + (1 - p) \log \left( (B - c) \frac{\alpha}{1 + \alpha} \right) - \log \left( x \theta_2 a \frac{\alpha}{1 + \alpha} \right) \right) < \frac{\Pr(\text{Peace})}{x}
\]

Since \( \frac{\partial \Pr(\text{War})}{\partial x} \geq 0 \), this implies that the impact of \( \alpha \) on the probability of war occurring is ambiguous.

**Proof.** To determine the impact of \( \alpha \) on \( x^* \) we need to determine the sign of the following expression:

\[
\frac{\partial^2 \mathbb{E} U(x)}{\partial x \partial \alpha} = \left( \frac{\partial G_P(x)}{\partial \alpha} - \frac{\partial G_W}{\partial \alpha} \right) \frac{\partial \Pr(\text{Peace})}{\partial x} + \frac{\Pr(\text{Peace})}{x}
\]

We know \( x > 0 \), \( \Pr(\text{Peace}) \geq 0 \), and \( \frac{\partial \Pr(\text{Peace})}{\partial x} < 0 \), but evaluating the sign of this expression also requires determining whether \( \frac{\partial G_P(x)}{\partial \alpha} - \frac{\partial G_W}{\partial \alpha} > 0 \). This is equivalent to part of the proof for Proposition 3, i.e. we start with:

\[
\frac{\partial G_P(x)}{\partial \alpha} = \log \left( \frac{x \theta_2 a}{1 + \alpha} \right) + \frac{\alpha}{x \theta_2 a} \log \left( \frac{\theta_2}{1 + \alpha} \right) + \frac{1}{1 + \alpha} - \frac{x}{1 + \alpha} \frac{1}{(1 + \alpha)^2}
\]

And then compute:

\[
\frac{\partial G_W}{\partial \alpha} = \frac{\partial}{\partial \alpha} \log \left( \frac{A - c}{1 + \alpha} \right) + \frac{1}{1 + \alpha} - \frac{1}{1 + \alpha} \log \left( \frac{B - c}{1 + \alpha} \right) - \frac{1}{1 + \alpha} \frac{1}{(1 + \alpha)^2}
\]

\[
= p \log \left( \frac{A - c}{1 + \alpha} \right) + (1 - p) \log \left( \frac{B - c}{1 + \alpha} \right)
\]
Thus, as in Proposition 3, we have that \( \frac{\partial G_P(x)}{\partial \alpha} - \frac{\partial G_W}{\partial \alpha} > 0 \) iff the expected utility obtained by group 1 in peace exceeds their expected utility obtained in war.

Therefore, via substitution, \( \frac{\partial^2 {EU}_G(x)}{\partial x \partial \alpha} < 0 \) whenever the following holds:

\[
\left[ p \log \left( \frac{A - c}{1 + a} \right) + (1-p) \log \left( \frac{B - c}{1 + a} \right) - \log \left( \frac{x \theta_2 a}{1 + a} \right) \right] \frac{\partial \text{Pr}(\text{Peace})}{\partial x} > \frac{\text{Pr}(\text{Peace})}{x}
\]

While the reverse holds when this condition is reversed. Since \( \frac{\partial^2 {EU}_G(x)}{\partial x \partial \alpha} < 0 \) is a sufficient condition for submodularity, when this holds \( x^* \) is decreasing in \( \alpha \), and thus the probability of war is decreasing in \( \alpha \). Since \( \frac{\partial^2 {EU}_G(x)}{\partial x \partial \alpha} > 0 \) is sufficient for supermodularity, when this holds \( x^* \) is increasing in \( \alpha \), and thus the probability of war is increasing in \( \alpha \). This establishes that the impact of \( \alpha \) on \( x^* \) and thus the probability of war is ambiguous.

This surprising result suggests that increasing the weight that government places on the party that benefits more from war can in some cases make war less likely. How could this be the case? The intuition is that if the offer \( x^* \) is high enough, and the ability to tax peace’s beneficiaries is also high enough, then the war-benefitting group may end up getting more or nearly as much in a peaceful outcome as they get from war, once redistribution is taken into account. Note that from the proposition, because \( \frac{\partial \text{Pr}(\text{Peace})}{\partial x} \) is negative, the utility obtained by group 1 from a peaceful bargain must be higher than the expected utility they obtain in war for the condition to hold.

If this is the case, then there can still be a positive probability of war due to the risk-reward trade-off state \( G \) faces, but since increases in \( \alpha \) in this range have the impact of making peace relatively more attractive compared to war, the increase in \( \alpha \) leads to a decreased probability of war as state \( G \) becomes less willing to accept the risk.

**Illustrative Examples**

This paper’s model provides a useful lens through which to evaluate historical examples of war. The causes of any given war are, naturally, multifaceted, so it is difficult (perhaps impossible) to precisely identify any specific bargaining failure as “the” cause of that conflict; as such, the examples that follow are intended to be illustrative rather than dispositive, and should not be taken as conclusive evidence of the mechanisms outlined in this paper. Nonetheless, they suggest that attention to the interplay between domestic distributive politics and redistributive frictions can enrich our understanding of the underlying factors generating conflict, illustrating the potentially important substantive implications of this paper’s theoretical contribution.

**American Revolutionary War**

Consider first the American Revolutionary War. Historians estimate that the war was actively supported by approximately 40% of the population of the colonies prior to war onset.
Calhoon 2000, p. 235); a possible plurality of the population, but not by much. Moreover, economists estimate that the total cost of The Navigation Acts was fairly minimal - about 0.6% of colonial income (Irwin 2016, p. 37) - while the war resulted in what may have been the greatest income slump ever in the United States in percentage terms (Lindert and Williamson 2013, p. 741). These characteristics - in conjunction with the fact that the British-imposed taxes that escalated the conflict were, at least in isolation, fairly trivial - has led some historically driven political economists to suggest that the revolutionary war is a puzzle for rationalist conflict scholars, with some extant explanations relying on non-standard solution concepts such as self-confirming equilibrium (de Figueiredo et al. 2006), or invoking a “costly peace” mechanism of investment distortions from the perceived possibility of predation (Coe 2011).

This paper draws our attention to another possible contributing factor: distributive politics. While the costs of Britain’s system of tariffs and subsidies to the United States were overall fairly low, there were significant distributive effects, with many of the most serious costs concentrated on the strongest supporters of the war, such as farmers in Maryland and Virginia who were hit hard by a collapse in tobacco prices (Irwin 2016). Furthermore, the impact of the taxes imposed by the British in the lead-up to the war was often highly unequal, and the responses to these taxes also often had significant redistributive implications. For instance, the “non-importation” movement that first arose in response to the Stamp Act began as a private initiative amongst colonial merchants who were “not simply acting out of principle... they were also taking advantage of the opportunity to reduce their large inventories, which had accumulated during the recession that followed the initial boom at the end of the French and Indian War, at much higher prices than would otherwise be possible” (Irwin 2016, p. 40).

Similarly, the Tea Act, which actually reduced duties on tea but gave a monopoly to the East India Company in an attempt to undercut colonial smugglers, produced a strong and escalatory response from colonial merchants, many of whom were very likely also involved in smuggling (Irwin p. 43). Thus, the collision course between the colonists and the British was to a significant extent driven by factional interests. This is not to discount the importance of the constitutional disputes that have been the focus of many historical accounts of the conflict (e.g. Rakove et al. 2000), but to suggest that these disputes perhaps do not tell the whole story, particularly given, as Lynd and Waldstreicher (2011, p. 609) note, “the commercial dispute preceded the constitutional, not just once but again and again in these years. It is important that colonists melded economic and constitutional arguments under the category of sovereignty - but not so important that we should ignore the originating nature of economic forces.”

What this paper adds to this discussion is both an argument for a greater focus on the distributive politics roots of the conflict (which have often been downplayed by historians), and an explanation of how the constraints to redistribution that existed at the time interacted
with these factional interests. Coming at a time in which there was very little redistribution amongst the colonists (e.g. few taxes of any kind or government spending programs), influential groups such as colonial merchants and tobacco farmers were left with very few policy tools through which to advance their interests. For instance, farmers could not realistically organize to lobby for farm subsidies, and merchants could hardly petition the government to help manage the sales of surplus inventories, while these kinds of policies would likely be the focus were similar grievances to arise in modern times. This model suggests that in this environment of limited ability to redistribute, the conditions were ripe for an influential minority to wield disproportionate influence over the decision of whether or not to go to war.

**Mass Warfare and Progressive Taxation**

Scheve and Stasavage (2010, 2012, 2016) provide a comprehensive set of studies in which they identify an important regularity: namely, that mass warfare in the US and Europe appears to have been linked with sharp increases in the *progressivity* of taxation, not just in the *amount* of taxation. For instance, their 2010 piece focuses on World War I, and compares countries that were active participants in the war (including the U.K., Canada, France, and the U.S.) with those that were not. They demonstrate that “Either during or soon after the end of the war, participant countries adopted steeply graduated rate schedules with top rates... that had previously [been] seen as ‘preposterous’ ” (Scheve and Stasavage 2010, p. 538), while neutral or minor participants - such as Sweden, the Netherlands, and Japan - saw no such dramatic changes. Furthermore, they describe the circumstances in which these policy changes occurred: namely, they were the result of strong pressure from labor and other left wing groups who explicitly invoked the idea that war's burdens were not equally shared across groups, and thus more progressive taxation was needed in order to ensure “equal sacrifice” for all (Scheve and Stasavage 2010, p. 541).

This paper does not have anything to add to Scheve and Slaughter’s empirical analysis; what the model offers is a new way of interpreting this regularity. Propositions 2 and 5 outline that the conditions for war become easier to satisfy as the ability to tax those who experience fewer of its burdens increases. In the case of World War I, states clearly had the ability to redistribute value from those who were less affected by the war, given that they explicitly exercised this ability in the form of “war profits” taxes and significant increases in the progressivity of income taxation. Moreover, they did so as part of a clear domestic bargain aimed at sustaining support for the war, at a time when enthusiasm had waned in the face of growing awareness of the war's costs. While this paper's model is not explicitly dynamic, as it is designed to interrogate the effects of domestic politics at any particular “slice” in time, it draws attention to the fact that sustaining the conditions for war will often entail compensating groups who are differentially subject to war’s costs. It is therefore striking to see these kinds of compensatory bargains unfold with fairly similar features in a wide-variety of countries faced with similar circumstances during World War 1, and to see them reflected more generally in broader patterns linking mass warfare and progressive taxation.
Iraq War

As detailed by Lake (2010), the lead up to the Iraq War contained a multitude of factors generally associated with bargaining failure, including incomplete information surrounding the existence of weapons of mass destruction (WMDs), and commitment problems associated with Saddam Hussein’s inability to credibly promise not to build weapons of mass destruction (WMDs) in the future, even if they did not exist at the time. Nonetheless, the high costs of the war - trillions of dollars for the US, and thousands of lives on both sides - and the hard line taken by the Bush administration that ultimately escalated the conflict, have left open questions about the war’s genesis.

An important collection of such questions pertains to the role of distributive politics in the war. These distributive politics were certainly a significant part of the popular narrative surrounding the conflict: the billions of dollars in contracts awarded to Halliburton came under particular scrutiny given Vice President Cheney’s role as CEO of Halliburton from 1995-2000, and more broadly claims of “blood for oil” abounded amongst those who believed the conflict was driven by oil interests and profit opportunities for military contractors. Representative Charles Rangel regularly advocated for Congress to bring back the military draft, with his argument explicitly linked to the idea that those making the decisions to authorize force were likely to experience few of the war’s burdens, noting in a New York Times op-ed that “A disproportionate number of the poor and members of minority groups make up the enlisted ranks of the military, while the most privileged Americans are underrepresented or absent.”

So what would this paper predict in these circumstances? In this case, the variation of the model that includes uncertainty is especially informative. To start, for reasons of political optics and perhaps ethics, it would prove very difficult for a state level agent to engage in any obvious peacetime redistribution from those who experienced the higher burdens of the war (e.g. potential volunteer soldiers) to those who would experience the highest gains (oil and defense contractors). This did not eliminate the possibility that war’s potential beneficiaries could lobby for other implicitly redistributive forms of favor from the government - for instance, they could pursue better tax treatment, or other support for their operations abroad - but it did introduce some degree of friction in the redistributive politics game surrounding the war.

While information problems would likely have generated a baseline positive probability of war without any other contributing factors, Proposition 6 provides clear implications for what we would expect the impact of distributive politics to be in such an environment. Namely, we would expect the state level agent to take a harder line than they would if they were unbiased (i.e. demand a higher $x^*$ in equilibrium), thus leading to a higher probability of war. This appears to correspond closely with what we actually observed: there were

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legitimate tensions between the United States and Iraq over the existence of WMDs and their future visions for the region, but many were still surprised by the hastiness with which the Bush administration was willing to push for war, and their unwillingness to work with international allies.

**Conclusion**

In this paper, I have presented a model that demonstrates that costs to side payments (i.e. indivisibility problems) between domestic parties can be a determinative cause of war, or a factor that exacerbates other possible causes of war. I have also demonstrated that internal indivisibility problems play an essential role in incorporating domestic distributive politics into the bargaining model of war. Without them, no amount of disproportionate influence wielded by war’s beneficiaries can affect the onset of conflict. Furthermore, while the model demonstrates that internal indivisibility problems are a necessary condition for “pathological domestic politics” to be a proximate cause of war, it also shows that reducing these bargaining frictions does not always lead to a decrease in the probability of war; in fact, reducing the costs to transferring value from war’s beneficiaries makes war more politically achievable. Thus, this paper contributes to our understanding of the conditions under which an agency problem derived from domestic distributive politics can lead to war, and provides a new set of empirical implications that can be useful for understanding specific cases and broader patterns of conflict.

**References**


