War Is in the Error Term

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> The main theoretical task facing students of war is not to add to the already long list of arguments and conjectures but instead to take apart and reassemble these diverse arguments into a coherent theory fit for guiding empirical research.[1]

At least since Thucydides, students of international relations have sought rational explanations for the advent of war. Rationalist explanations assume purposive action; states are said to make reasoned decisions about the use of force. Although rationalist explanations have proven persuasive, durable, and offer the basis for cumulative theorizing, they also imply substantial limits on what we can know about war. I show that the most general rationalist explanation for war also dictates that the onset of war is theoretically indeterminate. We cannot predict in individual cases whether states will go to war, because war is typically the consequence of variables that are unobservable ex ante, both to us as researchers and to the participants.[2] Thinking probabilistically continues to offer the opportunity to assess international conflict empirically. However, the realization that uncertainty is necessary theoretically to motivate war is much different from recognizing that the empirical world contains a stochastic element. Accepting uncertainty as a necessary condition of war implies that all other variables—however detailed the explanation—serve to eliminate gradations of irrelevant alternatives. We can progressively refine our ability to distinguish states that may use force from those that are likely to remain at peace, but anticipating wars from a pool of states that appear willing to fight will remain problematic. For example, we may achieve considerable success in anticipating crises, but our ability to predict which crises will become wars will probably prove little better than the naive predictions of random chance. The need for uncertainty to

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1. Fearon 1995, 382.
2. I thank an anonymous reviewer for suggesting this phrasing of the argument.

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account for war means that the same conditions thought to account for war must also exist among states not destined to fight. Otherwise, states themselves will differentiate between opponents in a way that either removes the motives for war or restores uncertainty. It has long been accepted that social processes possess an element of uncertainty, but the centrality of uncertainty to rationalist explanations for war means that the advent of war is itself stochastic. War is literally in the "error term."

Readers may not adopt this argument enthusiastically. In addition to the healthy skepticism that is a hallmark of intellectual rigor, students of international conflict may be personally and professionally attached to the idea that war can be explained—if somewhat imperfectly—in positivistic terms. The argument I develop here resides within the positivist approach, and it cannot be eliminated, at least for a major set of explanations, without conceding deductive rigor. Positivist theories are intended to distinguish outcomes through changes in explanatory conditions. A positivist science of international conflict seeks to identify variables whose values lead states variously down the path to war or to peace. Rationalist theory points to information as one of these variables. War may occur if states are uncertain about aspects of their opponent's ability or willingness to use force. Wars are averted or resolved as enough information is revealed about these conditions to facilitate mutually acceptable bargains. Yet uncertainty requires that it must also be possible for states facing uncertainty to remain at peace. Otherwise, uncertainty would no longer be uncertain. Thus, unless researchers are better informed than the participants themselves, such an explanation cannot simultaneously require states to be unable to identify whether war will ensue and serve to distinguish war from peace.

The scope of the argument and its impact on empirical research depends on factors about which I can only speculate in this article. Where uncertainty is associated with both war and peace, rationalist theory violates the positivist tenet of a functional relationship between cause and effect. Yet uncertainty must be associated with both war and peace to be uncertain. The problem persists even when using probabilistic language. How much uncertainty is necessary for war? A careful statement of the extent of the violation awaits additional research. Even so, an initial exploration of the argument may be worthy of some attention. Unfortunately, since the impact of the indeterminacy is most felt on the behavior of greatest interest, the argument directly challenges the validity of inferences in qualitative studies of international conflict regardless of the amount of uncertainty needed to motivate war. As I show in this article, explaining war in individual cases becomes tantamount to accounting for the advent of "heads" in the toss of a coin.

In the sections that follow, I first provide a sketch of the literature, focusing particular attention on James Fearon's summary of "Rationalist Explanations for War."[3] Second, I lay out a more detailed explanation of the argument. I show why the conditions posed by Fearon are necessary but not sufficient to account for international conflict. Sufficient criteria can only be obtained in a manner that makes the onset of war stochastic. Third, I provide a simple formalized example of the argu-

3. Fearon 1995.

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ment. Fourth, I discuss implications of the argument for empirical analysis. Finally, I conclude with a brief summary and a few comments.

Rationalist Explanations for War

Explanations for international conflict are a bit like layers of an onion. Each layer surrounds the one inside it, defining the inner layer's shape as well as being delimited by it. As a research community, we strip away the layers, gradually closing in on the behaviors proximate to the core events of interest. The initial layer of rationalist explanations for war begins with the tools used in conflict. States are said to be more or less likely to fight based on power or capabilities or on relationships between or among states' power or capabilities.[4] It is reasonable to argue that states possessing the material resources for war may engage in conflict behavior. However, the presence of tools alone is not sufficient to account for the act. A shortcoming with power or capabilities as an explanation for war is that it is not clear why having power yields war as a consequence. Because war is costly, states must have some motive for using force. Traditional theories assume uniform motives for war or other costly contests associated with egoistic actors, competition, or international anarchy. However, uniform motives cannot explain differentiation in behavior among actors with similar power or capabilities.

Another layer of argument proposes that interaction between capabilities or power and preferences (differentiated motive) can account for war. Combining capabilities and intent, opportunity and willingness, or probability and utility may better explain the presence or absence of international conflict if conflict is in part predicated on motive.[5] An advantage of this layer is that it explicitly excludes a much larger portion of cases. The majority of countries seldom or never engage one another in costly contests, either because such contests are too costly or because the motives for war are too limited. Yet, this layer of argument also fails to explain why states with the right combination of motives and capabilities should choose the costly mechanism of war as their exclusive method of arbitration. Showing that a state is willing and able to do something is not the same as showing that the thing must happen.

In a recent article Fearon provides a third layer of explanation, informed by and responding to the previous, "outer" layers of rationalist theory. He "attempts to provide a clear statement of what a rationalist explanation for war is and to characterize the full set of rationalist explanations that are both theoretically coherent and empirically plausible."[6] Fearon seeks to identify the causes of war that are consistent with the rationality assumption(s). He begins with two stylized observations. First,

4. The literature on international relations is rich and multifaceted. Any summary, of course, distorts and misleads to some extent in an effort to manage details concisely. Major proponents of realism provide the most eloquent statements of their own positions. See, for example, Carr 1946; Morgenthau 1954; and Waltz 1959 and 1979.

5. See Bueno de Mesquita 1981; and Bueno de Mesquita and Lalman 1992.

6. Fearon 1995, 380.

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states often have incentives to compete. Second, certain modes of competition (such as war) are more costly than other methods (negotiation, bargaining). For states that compete through war, the loss in lives and property reduces the benefit or increases the burden of eventual settlements. Therefore, states are better off obtaining a given settlement without a costly contest. Rationalist explanations for war are then accounts of why states are unable to bargain and obtain settlements ex ante for which they settle ex post.

Fearon's article deftly exposes the deductive flaws in realist and most contemporary rationalist explanations for international conflict. Fearon points out that, although both power and preferences are likely to influence the nature of settlements reached between competing parties, and in their absence can account for peace, such factors tell us little about why states choose to fight. Any variable likely to influence the conduct and consequences of war (such as power or resolve) that is knowable prior to the contest can simply be factored into a settlement that averts the need to fight. Indeed, even uncertainty about these variables does not necessitate war. States in competition must have incentives to bluff or deceive their opponents. Otherwise, states could resolve their uncertainty by simply sharing information.

The game of poker provides a good (though limited) analogy for the nature of strategic interaction leading to war or peace. As Carl von Clausewitz says, "In the whole range of human activities, war most closely resembles a game of cards."[7] The goal in poker is to use the cards one is dealt to acquire other players' money (or some equivalent). Players make bets, attempting to minimize their losses from bad hands and maximize their gains when chance offers better cards. An initial look might tell us that cards and money are very important to poker games and that explaining poker comes down to knowing who has the most money or who has the best luck. Although these factors are important, more experienced players would quickly contradict the intuition. Winning at poker has as much to do with judging human personalities as it does with weighing the cards. Indeed, players that too clearly establish a pattern with their betting betray even their capabilities. Thus, one might claim that poker comes down to being able to judge the preferences and character of one's opponents.

One of the factors that makes poker a game is the deliberate introduction of a randomizing element. The cards are shuffled and dealt so that (if done fairly) each player stands an equal chance, ex ante, of receiving any given card. Without this possibility, the game would be substantially less interesting precisely because it would be less uncertain. The nature of international relations is different from poker because for countries the deck is stacked. What Fearon in effect asks us to imagine is a poker game in which each player is permanently assigned a particular set of cards. Players would soon identify which players had which hands. In such a game, betting is problematic. Players that are sure to lose will minimize their losses by making no bets. Winners in such a game can gain little from their good fortune. No factors identified in the first two layers of explanation have been removed, of course. The cards remain, as does the money and the motives of players. However, playing poker without uncertainty about the players' hands is no longer really poker. Removing

7. Clausewitz 1976, 86.

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cards or money may terminate a poker game, but even with these items, poker is meaningless without uncertainty.

The analogue to war is limited because poker is a game. Part of the motive for playing poker for many adherents is its consumption value. A game of poker can be fun. But war is no game. It involves human suffering and loss of resources even for the winners. If, instead of the psychic benefits of play, participants in a poker game suffer some hardship, it seems likely that they should prefer no game at all. If an official administered a burning torch to a portion of each player's holdings after each round of play, the incentives states experience in international interaction might be approximated. Under such a scheme, players would have little incentive to linger and would likely prefer to settle accounts without delay. If the burning torch is a metaphor for war, then explaining the presence or persistence of the torch is equivalent to explaining why some players are unable to resolve their contest before some of their assets go up in smoke.

Fearon actually develops three arguments intended to explain why states in conflict sometimes fail to settle ex ante for bargains they accept ex post. First, war can occur because bargains are predicated on factors about which states possess private information (such as capabilities or resolve) and because states have incentives to misrepresent this information. In an uncertain world, egoistic states can often benefit by bluffing. The only way to distinguish bluffing from genuine statements is for states to act like poker players and call one another to account, to force each other to "ante up" through costly contests. Second, wars derive from commitment problems. States fight because agreements are not binding and because actors have unilateral incentives to defect at a later point. The argument is analogous to the conditions posed by power transition theory.[8] Third, states are unable to bargain short of war because the issues in dispute are not readily divisible. Fearon dismisses the third explanation as empirically trivial because states can make side payments or take other actions that resolve the problem and allow ex ante bargains.[9]

For similar reasons, the second explanation also appears problematic and, if valid, of extremely limited scope. Fearon argues that commitment problems—particularly preventive war—may lead states to fight even if they are fully informed about their competitors' capabilities and resolve. Changes in relative capability over time, for example, alter the bargaining power of states. If the anticipated changes are large enough, states may prefer to fight today rather than be forced to make concessions in bargaining tomorrow.[10] Although commitment problems explain the onset of war, they do so only by posing a related puzzle. Geoffrey Blainey's dictum about the termination of wars being in resolving the causes of wars would seem to represent a

8. See Organski 1968; Organski and Kugler 1980; and Kugler and Lemke 1996.

9. The explanations are treated in greater detail by Fearon 1995.

10. Fearon discusses preemptive war and offensive advantages, including those of the first-mover. Fearon 1995, 402–403. He points out that these conditions are generally amenable to the same bargaining logic applied elsewhere and therefore they do not typically motivate costly contests. Preemption and most forms of offensive advantage simply shrink the bargaining space. In the same context, prevention rationalizes war only if the benefits of the stakes accrue over time (such as territory). Future advantages in bargaining could still be resolved if present compensation exists that is either consumed (foreign aid) or, once exchanged, is not easily retrieved (infrastructure, technical assistance).

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conundrum for the second explanation.[11] If some wars occur because states cannot credibly commit to abstain from using future increases in bargaining power against opponents, then what about fighting facilitates credible commitments? States that can rationally choose to fight because of commitment problems cannot rationally choose to terminate contests until the commitment problems are somehow resolved. Preventive wars begun because of changing relative capabilities (for example, power transitions) would seem to end only with the abolition of future changes in relative capability or when at least one state can no longer physically continue the contest.

The problem with explaining war as a commitment problem is that, though understanding why states fight is easy, understanding why they ever stop is less so. Suppose that two states, A and B, fight because anticipated future increases in B's capabilities will make B much more powerful relative to A than it is at present. Suppose, too, that in the first stage of the contest, A launches an attack that cripples B's long-term prospects for development. In fact, B is now likely to fall far behind A's capabilities. The logic of preventive war suggests that, far from resolving the contest, A's attack now makes it impossible for A to commit not to pursue its bargaining advantage in the future. For the war to end, either one state must exhaust its ability to continue the contest or each side must establish that the other side cannot increase its bargaining power in ways that allow it to impose concessions greater than the cost of additional fighting.

This set of conditions, of course, is the same set that initiated the contest, except presumably each state has lost something to the contest itself during the first stage. As Fearon himself argues, if states can anticipate their future prospects in the contest, they would rather accept the consequences of those prospects than pay the cost of fighting. Thus, if states can anticipate the consequences of the first stage of fighting, they prefer to accept some settlement rather than pay the costs of fighting in the first stage. The states can then continue the contest, beginning at the second stage and so on. By now, however, the reader has realized that the argument progresses, like a series of nested Russian dolls, until the final stage of the contest. Since some settlement eventually ends the contest, presumably the settlement resolves the commitment problem. If states do not face uncertainty about the future, each state can play the other state's game and the commitment problem can be solved ex ante by obtaining a similar settlement before fighting begins. Of course, incorporating uncertainty simply folds the second explanation (the commitment problem) into the first (uncertainty and incentives to bluff).

Fearon cites A. J. P. Taylor, who argues that "every war between the Great Powers [in the period 1848–1918] started as a preventive war, not a war of conquest."[12] I submit that for rational states the two types of warfare must be perceived as virtually the same. Given the previous explanation, preventive war can still occur if there is no solution to the commitment problem. However, this argument implies that fighting must ensue until one state is physically unable to continue. The problem of commit-

11. Blainey 1973.
12. Taylor 1954 (cited in Fearon 1995, 404).

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ment thus suggests that preventive wars inevitably involve long, highly costly contests. If preventive wars are "total wars," states must be aware that preventive wars are not like other wars. A fight to the finish induced by the commitment problem has its own deterrent effect that should make bargains look more appealing. Even states facing opponents with future incentives to defect will acquiesce if the cost of fighting is high.

The logic of preventive war thus implies one of three conclusions. First, if a solution exists to the commitment problem and states are assumed to be fully informed, then ex ante bargaining can occur for the same reasons discussed elsewhere by Fearon.[13] Second, if a solution exists but states are hampered by uncertainty and incentives to bluff, then preventive war is really just a special case of Fearon's first explanation. Third, if no solution to the commitment problem exists, then the costs of such contests are presumably extremely high. States are likely to anticipate the destructiveness of preventive war and avoid it in all but extreme situations. Finally, solutions similar to those used to address indivisibility do technically exist. For example, the commitment problem in war parallels the alliance commitment problem. States could use formal agreements to link their domestic or international reputations to behavior ex post in much the same way states use alliances to "tie the hands" of allies.[14] Alternately, states or other actors could in principle provide the present value of any agreement to the vulnerable party up front. The portion of military contests attributable to preventive war is, of course, unknown. Here, I simply assert that commitment problems necessarily imply contests that are intense and relatively rare.[15]

Thus, Fearon's first explanation for war is the most important for this study and, arguably, for the study of international conflict. Explaining war in rationalist terms must generally involve uncertainty and incentives to bluff. I address the rest of my comments to the uncertainty explanation as the primary rationalist explanation for war.

The Argument

The idea that certain aspects of war are random is not novel, but much of the serious study of international conflict is based on the conviction that war's causes are knowable. The claim here is that important theoretical and empirical components of war are not knowable. My argument is, of course, particularly radical when viewed from the perspective of the research community that adheres to the rationalist approach. Fearon's article is intended to clarify implications of the rationalist framework for international conflict. As such, it is designed to facilitate positivism. "The task of

13. Fearon 1995, 383–90.
14. Fearon 1997.
15. Interesting corroborating evidence comes from civil wars, where commitment problems appear to be a more prominent cause of conflicts (establishing agreements to which both parties can credibly commit is more difficult) and where more contests are bitter, "fight-to-the-finish" events. See Walter 1997. An interesting twist on the question of ethnic conflict is provided by Fearon and Laitin 1996.

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specifying the causal mechanisms that explain the occurrence of war must precede the identification of factors that lead the mechanisms to produce one outcome rather than another."[16] Yet, in attempting to specify the causal mechanisms that rationalize the occurrence of war, Fearon has opened an analytical Pandora's box. Fearon shows that holding logically consistent rationalist ideas about international conflict entails a distinct and finite set of causal mechanisms. Yet holding such ideas about international conflict also means that the causes of war are generally indistinguishable from conditions that could, but do not, presage war. Given uncertainty and incentives to bluff, *there are no factors* that lead the mechanisms explaining the occurrence of war to systematically produce one outcome over another. Properly understood, the causal mechanisms that explain the occurrence of war from crises in large samples are stochastic.

As researchers, we can identify a variety of factors that make states less likely to fight. We can identify factors that form the basis for prior conditions (such as conflict) and specify where uncertainty and incentives to bluff hold greater or less sway. We may even be able to predict international conflict if we have access to the information that is privately held by the competing states. However, if a logically consistent rationalist explanation for war requires that—to the participants themselves—the advent of costly contests must be uncertain, then the information available to participants cannot account for war. Therefore, the presence of information available to researchers can predict but not explain the occurrence of international conflict. That tests of theories of social conflict are probabilistic is not new. What may be novel is that the theories themselves are indeterminate. If as students of international relations our role is to identify the reasons for the occurrence of international events, and if one of the reasons for those events is uncertainty, then per force at least one of the reasons for such events is no reason at all.

Fearon seeks to present what we might loosely term an existence proof. His intent is to specify conditions within a rationalist framework under which war occurs. Indeed, his criticism of previous rationalist theories is that they fail to identify why states *must* choose war but only point to factors making war a possibility. The problem is that his explanation is also subject to this criticism. Do all states fight given uncertainty and incentives to bluff? If not, why do some states fight while others do not? To address these questions—and to understand how they relate to the claim that the onset of war is stochastic—imagine a pair of rational states in conflict. For war to occur, states must differ over some aspect of policy or territory intensely enough to make fighting an option. For states to be unable to resolve their differences through bargaining, at least one state must be uncertain about the reservation price of the other state. (A reservation price is the minimum offer a state will accept rather than choosing the outside option of war. The reservation price relates state preferences to the cost of the costly contest. If the cost of the costly contest is expected to be $20 and states expect war to yield $50, states' reservation price would be $30.) Finally,

16. Fearon 1995, 410.

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states must have incentives to conceal their reservation prices (their relative willingness to suffer the costs of war, if necessary to achieve their preferred outcomes).

Given the preceding conditions, there are at least two reasons why war cannot always occur. First, some states will be satisfied with the offers they receive in bargaining. They will prefer accepting the bargains to fighting. If states fail to make offers or make offers that no opponent will accept, then at least some of the time such states unnecessarily bear the burden of costly contests. Since states are always better off accepting the outcomes of costly contests ex ante, any offer within the Pareto space (the range of outcomes between each state's "ideal" outcome) will be preferred by at least one opponent to the option of war. Second, if uncertainty and incentives to bluff always lead to war, then states that prefer a bargained outcome based on their capabilities and resolve will simply reveal themselves to their opponents. Yet all states prefer a bargain to a costly contest that yields the same outcome.

If war does not always occur given uncertainty and incentives to bluff, then these conditions may be necessary, but they are not sufficient. Using Fearon's first explanation, we will sometimes predict war when war does not occur. Explaining war then requires some additional condition or set of conditions that differentiates states facing uncertainty and incentives to bluff that fight from those that do not. We know that war occurs when at least one state underestimates the reservation price of its counterpart. We also know that war does not occur when a state overestimates an opponent's reservation price (leading the state to offer a bargain that, to the opponent, is at least as good as fighting). Explaining why some states overestimate reservation prices and others underestimate them explains why some states fight and others do not and constitutes an extension and refinement of Fearon's first rationalist explanation for war.

Yet in a rationalist framework nothing that is systematic about states accounts for the difference between these two conditions. To see why, let us begin with the antithesis. Suppose that something does distinguish states that fight from those that could but do not. In the language used earlier, suppose that there are factors that predict why some states underestimate the reservation prices of their counterparts (leading to war) and other states overestimate the reservation prices of their counterparts (and thus remain at peace). This supposition is fundamentally incompatible with the rationalist framework because we must then assume either that states do not act on information they have or that they act on information they do not have. If states are aware of any factors that serve to predict the likelihood or disposition of costly contests, then in a rationalist framework states should simply adjust their bargaining behavior in a way that subsumes the effect of the factors. If states are ignorant of factors that serve to predict the likelihood or disposition of costly contests, then the factors manifestly do not affect decision making. Rationalist states facing uncertainty are said to have beliefs or rational expectations about those factors that they are uncertain of. In equilibrium, expectations are realized. On average, the beliefs of rationalist states must be correct; otherwise, states are irrationally misperceiving. The states would be better off with another set of beliefs but irrationally choose not to alter their expectations.

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Imagine again the poker game. Betting requires that players be uncertain about the outcome concealed by each player's private information about his or her own hand. Betting also requires that players seek gain (not a very controversial supposition). Yet, whether a player bets or folds (conceding and averting the costly contest) depends on that player's beliefs about his or her prospects in the contest. Even in bluffing—where a player with an inferior hand seeks to win by convincing other players that he or she holds superior cards—players are calculating their prospects against some beliefs about other players' future actions. Players that fold are saying, in effect, "I believe that your hand is better than mine, that you believe that your hand is better than mine, and that it is too risky to try to convince you that my hand is better than yours." Players that stay in the game are tacitly claiming that "I believe that my hand is better than yours, or that I believe that you believe that my hand is better than yours, or that I am willing to risk convincing you that my hand is better than yours." While uncertainty is necessary to make poker interesting and can lead to betting, what distinguishes those who bet from those who fold (assuming all else is equal, cards and so on) is that those who bet are more optimistic about their prospects than those who fold. In a rationalist framework, the difference in expectation cannot be a result of systematic factors ("equilibrium" conditions). Otherwise, they would be absorbed in the process of bargaining that surrounds the bet. Although poker stories often involve deception, the deception typically takes the form of one great hand. The deception cannot be repeated because opposing players use ex post information to alter their beliefs and thus their behavior. If some players are more optimistic than others, then other players will punish optimists in ways that encourage greater caution. If some players are more skillful than others, other players will tend to be more tepid in their bets. Indeed, entertaining games of chance deliberately and artificially inflate uncertainty (shuffling the deck) to remove predictable elements and hamper bargaining. Of course, imposing the rationality assumption(s) on poker players is itself risky, but it may be less unrealistic to think of leaders or states in this way. In the rationalist framework, states may be said to make best estimates of the reservation prices of their opponents in an effort to realize competing goals. Errors are costly (unnecessary concessions, unnecessary wars), so states or leaders must seek to adjust their offers in a way that on average is about right. What explains international conflict—what leads states to war or to peace—are precisely those factors that cannot be anticipated, that are unique to each event.

Such a rationalist state or leader is like an archer shooting at a target. The archer aims the arrow based on experience and observation, making the best guess about conditions that, on average, consistently affect the fall of the arrow. This does not mean that the archer can always land the arrow in exactly the same spot.[17] There are bound to be factors unique to each draw of the bow that affect the path of the arrow.

17. The archer does not need an analytical understanding of the relationship between variables affecting the path of the arrow. Nor must leaders articulate clear ideas about the correlates of war. Optimizing behavior can be motivated by evolution (archer *and* weapon), by selection (talented archers get more chances to practice), or by repetition (trial and error).

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Like the archer, states in conflict adjust their "aim" based on what they know and make a best guess about factors unknown to them. What remains is peculiar to the immediate decision at hand; it is stochastic. If states do not adjust their actions like the archer, they are not behaving rationally. States would be better off taking other actions based on other beliefs, and we require some alternative explanation (like misperception or systematic errors of choice) to account for states' behavior.

Fearon points out that states informed about strategic variables, such as capabilities and willingness to use force, generally cannot account for war in a rationalist framework, because in most cases we cannot explain why it is not possible to construct an ex ante bargain. Fearon poses certainty and uncertainty as dichotomies for the purpose of exposition, but his argument remains effective even if we think of information along a continuum. One interpretation of my argument is that I am simply relaxing Fearon's dichotomy. Rationalist states that know of some distinction between states' propensity to go to war are just informed to some degree about capability or resolve. Knowledge about differences in willingness can explain different settlements, but not why some settlements require costly methods of settling. Nor can uncertainty explain the actual choice of a demand. What states do not know may hurt them, but it cannot directly influence their decision making. States must base their demands on beliefs about their opponent's capability or resolve. States' beliefs, in turn, must be correct, on average, for the explanation to constitute a rationalist theory. If their beliefs are right, on average, then what makes states wrong in their particulars—what leads states to war or to peace—is unique to each case and is by definition unpredictable.[18] The predictable component of international interaction is subsumed by the expectations states have of one another. Because it is predictable, it cannot motivate war. The unpredictable component of international interaction can account for war, but because it is unpredictable, and because of the rationality assumption(s), we are left without any systematic relationship between sufficient causal factors and the event of interest.

Whatever states know about their opponent's capabilities or resolve cannot motivate war, and whatever states do not know cannot influence their demands. Thus, under Fearon's first explanation, any information available to states cannot explain international conflict because it does not account for the need for a costly contest and any information that states do not know is by definition independent of their decision making. This is a complete accounting for all possible states of information. Everything known and systematic about the bargaining relationship is embodied in the bargain.[19] Everything nonsystematic or unknown is embodied in the contest but is random with respect to the decision states make in going to war.

18. As discussed later, case-oriented approaches are even more vulnerable to the argument.

19. Students of finance have known this property for some time. Predicting changes in the value of goods and services in competitive markets is problematic. As efficient aggregators of information, securities markets embody the collective wisdom about the value of stocks, bonds, or commodities. Thus current prices represent rational expectations as to the future value of investments. Price changes result from shocks, unanticipated and therefore stochastic events. Important formative work was done by Fama 1965, 1970 and 1991. For an intuitive discussion, see Malkiel 1985.

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Fearon points out that uncertainty about resolve or capabilities is necessary but not sufficient to rationalize international conflict. For rational states to fight, some states must also seek to misrepresent their willingness to use or threaten force. Relatively weak or unresolved states must have incentives to mask the status of their reservation prices. Yet, for weak or unresolved states to successfully "hide" their status, it must appear plausible ex ante that these states are capable or resolved. We can again separate information into two categories. To the degree that camouflage efforts of weak or unresolved states fail, competitors correctly identify reservation prices and there is no motive for war. To the degree that weak or unresolved states blend successfully with more capable or resolved states, the reservation prices of states that could fight but do not are indistinguishable ex ante from the reservation prices of states that do in fact fight. In short, a rigorous rationalist explanation for war is one that is also most typically indeterminate.

A Simple Proof

I extend an example used by Fearon as a simple form of proof. Imagine that two pairs of states (dyads) play a game of divide the dollar (actually \$100). In Fearon's example, states keep any division of the money but pay a fee (\$20) for choosing to fight. For simplicity, victory at war yields the winner all the money (minus the costs of the contest) and the loser nothing (again, minus costs). Assume that each state has an equal chance at victory (50 percent). Thus the option of fighting has an expected value of ([0.5 × \$100 + 0.5 × \$0] – \$20) or \$30. If states are risk neutral, then any offer that yields each side at least \$30 is at least as good as fighting. Bargained outcomes from (\$31, \$69) to (\$69, \$31) are mutually preferable to war.[20]

Suppose that for one of the two countries (call it state A) the cost of fighting remains \$20 but that the other country (state B) has private information about its costs (**c**). Suppose that the costs of fighting for states like B range from zero to some value \$ $\overline{\mathbf{C}}$ (read "c upper bound"), $\mathbf{c} \in [\$0, \$\overline{\mathbf{C}}]$, where $\$0 \leq \$\overline{\mathbf{C}} \leq \$50$, and costs are distributed according to some exogenous function, $\mathbf{c} \sim \phi[\$0, \$\overline{\mathbf{C}}]$. Obviously, state B's costs are valuable information. If state B's costs are high (relative to its value for the money), then state A can make a more demanding proposal without fearing that state B will prefer to fight. If state B's costs are high, it has an incentive to conceal this information by pretending to have lower costs. State A, in turn, recognizes that

20. Risk propensity affects the size of the Pareto space (the range over which bargains are preferable to the lottery of war). Risk aversion increases the range of acceptable bargains, whereas risk acceptance reduces the Pareto space. If states are very risk acceptant, the payoff from a lottery may exceed the difference between the expectations for bargaining and the cost of a costly contest. Highly risk-acceptant states could thus potentially constitute a fourth rationalist motive for war (for example, Attila the Hun). However, this explanation suffers from a problem similar to that of preventive war. If one is to motivate international conflict by risk acceptance, then what about international conflict itself resolves this motive? Explaining international conflict in terms of risk acceptance seems to necessitate either continual conflict or risk propensities that change as a result of exogenous factors that would then really constitute explanations for war.

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state B has incentives to claim low costs whether or not state B's costs are really modest. State A knows that "talk is cheap," and therefore state A does not listen.

For simplicity, suppose that state A makes a demand that state B either accepts or rejects. If state B rejects state A's demand, then war ensues. What demand does state A make? State A can propose anything between $0 and $100. It can be shown that state A's optimal proposal is simply the expectation of the distribution of reservation prices for the types or opponents state A is likely to encounter, B, E(x). In simple terms, state A's best proposal is a division of the $100 that makes the "average" opponent weakly prefer state A's demand to war. Fearon's explanation for war is borne out by the example. States B with higher than "average" reservation prices prefer to reject the proposal and go to war.

The example also illustrates the indeterminacy argument, which is more relevant for our purposes. States B with higher than average reservation prices choose to fight, whereas those with lower reservation prices do not. What distinguishes war from peace is whether or not states B are more resolved or less resolved than state A's expectation of the distribution of types. Of course, this means that war or peace cannot be anticipated. Either event is equally likely and either occurs independently of what either actor knows prior to the contest.

We can change conditions in the model. For example, we can adjust the boundaries or alter the distribution of state B's costs. If signaling occurs and states that are resolved distinguish themselves from the sample, these states' reservation prices simply become known to state A. State A can now bargain effectively with the unresolved states B. State A is also informed that the remaining sample contains a smaller range of unknown states B that face relatively lower costs for fighting. State A simply reduces its proposal (a larger portion of the $100 is offered to state B) so that the offer again reflects state A's expectations about states B. The states B that remain are again equally likely to fight as to accept the proposal. However, war is less likely on the whole because part of the sample has been identified. Knowledge that certain states are unresolved can no longer motivate war because the uncertainty about their willingness to respond with force has been removed. In the next section I assess some of the implications of the argument for empirical analysis of international conflict.

Empirical Implications

My argument has a number of empirical implications. In general, we will want to inquire whether and how the argument impedes exploration and analysis of international conflict. A promising approach to empirical research highlighted by Fearon's description of rationalist explanations is signaling. Indeed, signaling theories are one of the few applications of rationalist theory to international conflict that respond well to Fearon's critique. Signaling theories argue that states are likely to vary in their ability to overcome uncertainty and incentives to bluff.[21] Certain conditions may

21. For examples of signaling theories, see Fearon 1994; Gartzke 1997; Powell 1996; and Smith 1996.

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make it possible for some states to communicate credibly. States able to engage in credible communication short of war reduce the need for the costliest kinds of contests and thus are less likely to need to go to war. Signaling theories are promising precisely because they link variation in the frequency or intensity of conflict behavior to variation in the ability of actors to overcome uncertainty. Applications of signaling theory are in their infancy, but if Fearon's argument about uncertainty is correct and if tests are well constructed, it should be feasible to pursue empirically oriented study of international conflict through signaling.

Still, the ability of signaling to delve into empirical events will depend on, and be limited by, the layer of explanation provided here. Fearon's critique of earlier layers of rationalist explanations is that in most cases they cannot motivate the behavior of interest. The explanations themselves do not explain war. Yet, even as Fearon's critique is persuasive, it is likely that outer-layer theories of international conflict are potent in their negative predictions. Theories based on the first two layers of rationalist explanation are relatively good at identifying the absence of international conflict. It may be trite to note that states lacking the materials of war seldom fight, but the observation also appears accurate. By the same token, expected utility and other theories eliminate the vast majority of cases in which costly contests probably do not obtain. The ability to predict many of the large number of cases of "not war" means that such theories may continue to receive attention.

We can apply a similar logic to the relationship between the indeterminacy argument and Fearon's first explanation. Signaling theories provide a basis for applying and evaluating the claim that states fight because of uncertainty and incentives to bluff. However, contrary to Fearon's claim, such theories are incremental, rather than categorical, improvements in that they remain incapable of distinguishing states that fight from those that could fight but do not. Fearon faults most previous rationalist explanations because they cannot explain international conflict. As I hope I have shown, uncertainty and incentives to bluff also fail to provide a sufficient set of conditions to motivate war. What uncertainty and bluffing do add is an additional layer of causal factors to the factors supplied by the first two layers of explanation. We have more information about why states may fight, but in completing the explanation—in peeling away the third layer—we find no layer behind. Nothing exists to link the first three layers to the core of events in which we are interested, and thus no empirical method at once adheres to a rigorous rationalist explanation for war and fully conforms to the positivist framework. If Fearon's critique of previous explanations for war is that they cannot account for the event, then this extension points to the same problem. The argument is humbling in the sense that it suggests that an important analytical framework in international relations is limited in what it can achieve. More precisely, the rationalist framework may have succeeded in identifying inherent limits in the subject of international relations comparable to those in physics or finance. Yet rationalist theories of war can still go far in telling us about international relations as long as we are willing to accept them as predictors not of war, but of peace.

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Since prior conditions like capability or resolve vary among states and combinations of states, it is still possible to make claims about where international conflict is unlikely to occur. Further, states or combinations of states probably vary in their ability to identify their counterparts' capability or resolve short of costly contests. As the preceding proof implies, states that are better able to single out unresolved opponents at lower levels of escalation are more likely to avoid war. Research on the democratic peace, for example, that identifies conditions that enhance or detract from states' ability to address uncertainty should tell us more about which states do not fight. Implications of my argument are not reassuring for the study of international conflict. Nevertheless, the extent to which the argument impinges on the ability of applied researchers to analyze international relations could be large or small, depending on how much the indeterminate character of uncertainty interferes with the functional relationship between cause and effect needed for positivist explanations.

To what extent does this argument affect the empirical study of international relations?[22] In the crudest terms it implies that the best predictions of which crises will result in war will be correct about as often as random chance. Suppose a researcher is able to identify (with no measurement error) states or combinations of states that possess Fearon's conditions for war. The states are capable and resolved and they experience uncertainty and incentives to bluff. The states so identified should fight about as often as they do not. More or less frequent fighting would imply that states have beliefs about their opponents that are suboptimal. If the states fight more often, then some states are consistently underestimating their opponents' resolve. If wars occur less than about half the time, states are consistently overestimating other states' capabilities or resolve. Another way to think about the situation is that the sample of wars carries with it an equal and opposite "shadow sample" of "not wars." The mechanisms selecting cases into the two samples must be stochastic. Otherwise, states would benefit from identifying the nonstochastic component of the selection mechanism and using this knowledge in their bargains. The shadow sample thus makes analysis "noisy" even at the theoretical level. Researchers' best predictions of war are inevitably subject to this indeterminacy.

Ironically, the threat of indeterminacy to research on international conflict is likely to be cushioned, in part, precisely because such research seldom attempts to directly predict or identify wars. Researchers using large-sample quantitative analysis seek to identify variables thought to be associated with an increased or decreased probability of international conflict or war. Yet the analysis is really more a process of elimination than of prediction. Variables or sampling techniques provide the basis for ignoring the great majority of cases in which states do not fight.[23] Since most states are not in conflict with most other states most of the time, analysis that identifies states or

22. My comments are tentative and informal, but I believe they are based on reasonable premises. Future research will seek to develop a concrete description of the magnitude of the problem for empirical research.

23. This is done explicitly when researchers adopt techniques like "politically relevant dyads" as sampling techniques. See Maoz and Russett 1993; Oneal and Russett 1997; and Russett, Oneal, and Davis 1998.

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combinations of states that lack the basic prerequisites for costly contests is likely to demonstrate statistical significance and perhaps even substantial predictive power. It should be emphasized, however, that such analysis is really predicting peace rather than war. Cases lacking the necessary conditions for war may be identified and distinguished from cases possessing necessary conditions. On the other hand, cases possessing necessary conditions cannot be distinguished based on sufficiency precisely because sufficiency does not exist. The more sophisticated the analysis, the greater the "cutting power" of the distinction between the presence or absence of necessary conditions. However, in the end, no technique (however sophisticated) can distinguish necessary and sufficient conditions for war.

It is important to emphasize that the empirical problem originates at the theoretical level. Students of international relations are accustomed to the idea that their explanations for international processes will work somewhat imperfectly in "the real world." The world is complex and, after all, theories are simplifications of reality. The purpose of theory is to account for the underlying relationships that are most important in determining cause and effect. Yet here the theory itself is saying that the relationship between cause and effect is bounded, that war can only be explained indirectly and incompletely. Even before we enter the "real world" to examine our theory, the theory itself identifies the stochastic element as the key causal variable.

Case study methodologies may be doubly plagued by the problem of indeterminacy. Typical critiques of the case study method point to sampling problems and overdetermination.[24] Proponents respond that case studies allow a more contextual and varied assessment of the precursors of an event of interest.[25] Yet the indeterminacy argument implies that, for any set of conditions said to precipitate a military contest, there must also be cases in which the conditions do not precipitate a contest. In other words, even if a researcher correctly identifies conditions leading to war, the fact that those conditions result in war in a particular case or even a set of cases is purely fortuitous (if such can be said of war). Researchers can use case studies to identify the presence or absence of conditions necessary for international conflict, but claims that certain circumstances lead to war should be treated as suspect. Even a critical or comparative case approach proves difficult, since causal factors may be incorrectly rejected if they fail to lead to war in one case or incorrectly accepted if they are associated with conflict in another.

This critique is far more potent than previous concerns about sampling and inference. Suppose a researcher develops an argument that certain conditions lead to war. The researcher may support the argument with a series of case studies showing that in cases where the conditions are present, war ensues, and in cases where some or all of the conditions are absent, war does not occur. Discussion of the argument posed in this article leads us to expect that even if the researcher has correctly identified

24. See, for example, Fearon 1991; King, Keohane, and Verba 1994; and Nachmias and Nachmias 1987.

25. See George and Smoke 1974 and 1989; Lebow 1981; Lebow and Stein 1989; and Jervis, Lebow, and Stein 1985. For research that synthesizes large-sample quantitative analysis and multiple case studies, see Brecher and Wilkenfeld 1997.

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conditions leading to war, there should also be cases where the same conditions do not lead to war. Suppose a critic of the researcher's explanation points to cases in which the researcher's conditions are present but no war occurs. What does this imply? We cannot reject the theory based on this new information, since indeterminacy implies that the researcher's theory is bound to be associated with cases in which no war occurs. In fact, since rationalist theories for war must typically be associated with the indeterminacy, no rationalist theory of war can be rejected by even a series of contradicting cases. Similarly, the fact that a set of conditions is thought to motivate international conflict in one or several cases does not preclude the possibility that it fails to motivate conflict elsewhere. Accepting the indeterminacy argument generally means that qualitative methods cannot distinguish between rationalist explanations for war.[26]

The indeterminacy associated with rationalist explanations for war makes a much stronger argument in favor of large-sample studies than previous critiques of the case study method. Indeterminacy implies that the only effective way to evaluate rationalist theories is to make certain that one is assessing explanations against either the population or a representative sample of cases including wars as well as nonwars. Even if one uses a representative sample, theories motivating international conflict based on uncertainty and incentives to bluff can, at best, tell us when war is more or less likely. Such theories can never tell us with a high degree of reliability when wars will occur. This does not appear to be too much of a restriction for researchers accustomed to discussing the causes of war in probabilistic terms. However, the probability of war, properly understood, is never really being assessed directly. Future studies may improve our ability to distinguish between states that will not fight and states that could fight. What will prove a durable barrier is our ability to differentiate between states that could fight and those that actually go to war.

Conclusion

Exempting commitment problems and bargaining over indivisible goods, there are three situations in which one should find a consistent theoretical basis for statistically significant empirical relationships derivable from rationalist theory. First, rationalist theory (or other types of theory, for that matter) can tell us something about distinguishing between states that might fight and states that have no motive to do so. If states have no disagreements or if the material obstacles to war are such that no amount of disagreement is likely to lead states to fight, then an expected utility

26. Suppose we hypothesize that states always fight. Normally, all we would need is one case of peace before we could reject the hypothesis. But the indeterminacy argument means that we cannot reject the "always fight" hypothesis until we show that states are at peace most of the time. Otherwise, we might reject a hypothesis that is correct as a result of the indeterminacy rather than the information contained in the hypothesis. Addressing the indeterminacy thus requires information about the sample properties of war—information that is unavailable through case studies.

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approach or comparative case studies can go far in identifying the large majority of cases where war is not practicable. Yet this opportunity skirts most conflict researchers' real interests. Students of war want to understand, explain, and, it is hoped, anticipate war. This argument suggests that there are inherent limits in our ability to do so, at least within the framework of rationalist theory. Second, international conflict may be analyzed where researchers are privy to information about states' capabilities or resolve that is unavailable to the participants. For example, researchers might identify states that are (or, retrospectively, were) more resolved than their opponents expected. However, such an approach is largely descriptive. As I note earlier, the approach uses information known to be unavailable to the countries themselves, so it cannot provide a rationale for their decisions. Perhaps more important, the approach relies on information that is probably unavailable ex ante and that is encumbered by the problem of tautology ex post.[27] It is difficult to imagine that researchers will identify states' true capability or resolve if such factors are opaque to the governments themselves. At the same time, once events have precipitated, researchers may be tempted to impute resolve (or its lack) based on the behavior of the actors. For wars to happen, states must be willing and able to lie about their capabilities or resolve. To succeed, a bluff must be indistinguishable from genuine behavior. Differentiating states without using the consequences of events will thus be extremely difficult, since the existence of international conflict is itself explained by the inability of states to distinguish genuine from bluff.

Beyond this, rationalist theory can differentiate states that fight from those that do not if and where pairs of states differ systematically in the amount of uncertainty that exists between them. The uncertainty and incentives to bluff that motivate international conflict also imply that states may communicate credibly through mechanisms that facilitate signaling. Signaling occurs when states communicate capability or resolve in a way that differentiates resolved actors from those less willing to use force. War itself is a signal. The cost of war means that some states demur, separating themselves from others with greater capabilities or resolve. Groups of states that are better able to credibly communicate resolve by signaling short of war should be less likely to fight. Signaling, as with other explanations, actually removes states from the sample of states that appear willing to use force by the states' unwillingness to act in other, less costly ways. Signaling behavior potentially changes the amount of uncertainty states have about one another. The distinction between states that remain and fight and those that remain and do not continues to be unobservable ex ante. Thus, an internally consistent rationalist explanation for war implies that wars occur (or fail to occur) in a manner not fully accountable to the positivist goals that motivate contemporary research on the subject. Explaining war becomes a humbler task than that advocated by many since Thucydides.

27. Fearon alludes to this problem: "Only if leaders are affected by significant cognitive biases will academics be able to predict outcomes better than the leaders themselves." Fearon 1992, 181–82 n72.

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Appendix

Variables

$\mathbf{d}$ = State A's proposal [$\$0 \leq \mathbf{d} \leq \$100$]
$\mathbf{p}$ = Probability that state B rejects state A's proposal (that is, "war") [$0 \leq \mathbf{p} \leq 1$]
$\mathbf{c}$ = State B's cost for fighting, $\mathbf{c} \sim \phi[\$0, \$\overline{\mathbf{C}}$ (read "c upper bound")], where $\$0 \leq \$\overline{\mathbf{C}} \leq \$50$, and ϕ is an exogenous probability density function ($f(\mathbf{c})$) known to both states

STATE B'S PROBLEM

$$\max \mathbf{U_B} \text{ w.r.t.} \mathbf{p}., \text{ s.t. } 0 \leq \mathbf{p} \leq 1$$

$$\mathbf{U}_B = \mathbf{p}\,(0.5 \times \$100 + 0.5 \times \$0 - \mathbf{c}) + (1 - \mathbf{p}) \times (\$100 - \mathbf{d})$$

$$= \mathbf{p}\,(\$50 - \mathbf{c}) + (1 - \mathbf{p})\,(\$100 - \mathbf{d})$$

$$\frac{\delta \mathbf{U}_B}{\delta \mathbf{p}} = (\mathbf{d} - \$100) + (\$50 - \mathbf{c}).$$

State B's reservation price for war equals $\mathbf{d} - \mathbf{c} - \$50$.

If $\mathbf{d} > (\$50 + \mathbf{c})$, then state B's utility is increasing in $\mathbf{p}$. If $\mathbf{d} \leq (\$50 + \mathbf{c})$, then state B's utility is nonincreasing in $\mathbf{p}$. Thus, state B accepts state A's proposal ($\mathbf{p} = 0$) if $\mathbf{d} \leq (\$50 + \mathbf{c})$, else $\mathbf{p} = 1$.

STATE A'S PROBLEM

$$\max \mathbf{U_A} \text{ w.r.t.} \mathbf{d}., \text{ s.t. } \$0 \leq \mathbf{d} \leq \$100$$

State A's beliefs ($\mathbf{b}_A$) about state B equal ($\mathbf{b}_A | \mathbf{c}, \mathbf{c} \in \mathbf{c} \sim \mathrm{U}[0, \$\overline{\mathbf{C}}]$).

State A's calculation of d: State A is uncertain about the reservation price (resolve) of its opponent (state B). State A calculates its best response to each type of player B weighted by the probability of encountering any given type of state B. Since there are a continuum of types of state B, state A's calculation of its optimal proposal ($\mathbf{d}$) is an integral. Since the probability of encountering any given type of state B is determined by the probability density function ($\phi = f(\mathbf{c})$), state A's optimal proposal is a function of the expectation of the sample of types of state B:

$$\mathrm{E}(\mathbf{c}) = \int_{\$0}^{\$\overline{\mathbf{C}}} \frac{\delta \mathbf{U}_B}{\delta \mathbf{p}} f(\mathbf{c}) \mathbf{dc} = \int_{\$0}^{\$\overline{\mathbf{C}}} (\mathbf{d} - \$50 - \mathbf{c}) f(\mathbf{c}) \mathbf{dc}$$

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Simplifying and assuming that $f(\mathbf{c})$ is uniform,

$$E(\mathbf{c}) = -1/2\ \$\overline{\mathbf{c}}^2 + \$\overline{\mathbf{c}}(\mathbf{d} - \$50)$$

State A's beliefs about state B imply that state B's reservation price for war equals $\$\overline{\mathbf{C}}(\mathbf{d} - \$50 - 1/2\$\overline{\mathbf{C}})$. This in turn implies that state A expects $\mathbf{p} = 1$ if $\mathbf{d} > (\$50 + 1/2\ \$\overline{\mathbf{C}})$, else $\mathbf{p} = 0$.

Since U_A is increasing in $\mathbf{d}$, state A prefers $\mathbf{d} = (\$50 + 1/2\$\overline{\mathbf{C}})$ to any $\mathbf{d} < (\$50 + 1/2\$\overline{\mathbf{C}})$, and $\mathbf{d} = (\$50 + 1/2\$\overline{\mathbf{C}})$ is preferred to $\$30\ \forall\ \$\overline{\mathbf{C}}$. In equilibrium, state A proposes $\mathbf{d} = (\$50 + 1/2\$\overline{\mathbf{C}})$. State B accepts (no war, $\mathbf{p} = 0$) if $1/2\$\overline{\mathbf{C}}$ (the mean value of $\mathbf{c}$) $\leq \mathbf{c}$, and rejects ($\mathbf{p} = 1$, going to war) otherwise. Since $\mathbf{c}$ (types of state B) is randomly and uniformly distributed about the mean, it is equally likely that state A encounters a state B that will fight as state A encounters a state B that will not fight. War is independent of actors' information about the game (since this is embodied in their bargaining positions) and random with respect to parameters in the game that are private information (since otherwise they would not be private). Q.E.D.

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