Bargaining Theory

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Outline

- Commerce
  - Gowa and Mansfield (1993), Gartzke (2007)
- Territory
  - Walter (2003), Simmons (2005)
- Ideology
  - Lake (1992), Rosato (2003)
- Identity
  - Huntington (1993), Henderson and Tucker (2001)

Bargaining Theory

- Politics is "who gets what, when, and how" (Lasswell, 1936)
- Not surprisingly, bargaining is also at the center of many important issues in international politics
- For example, states bargain over ...
  - the terms of a peace settlement
  - an alliance agreement
  - a trade agreement
  - the structure of an international institution

Class Presentation

Costanza and Delia to present on Powell (2002), "Bargaining Theory and International Conflict"

- Joint action often increases the size of the "pie"
- Potential gains from joint action create an incentive to cooperate
- However, each actor also wants to maximize its share of those gains
- Bargaining is about deciding how to divide the gains from joint action

Suppose

- Two players, 1 and 2, are bargaining about how to divide gains from cooperation
- Players are risk-neutral, i.e., $U_1(x) = x$ and $U_2(y) = y$
- Shaded region in Figure 1 is set of feasible outcomes
- Points along upper-right edge are the Pareto-optimal outcomes
- Point Q is the status quo (defines the payoffs players receive if they fail to reach an agreement)

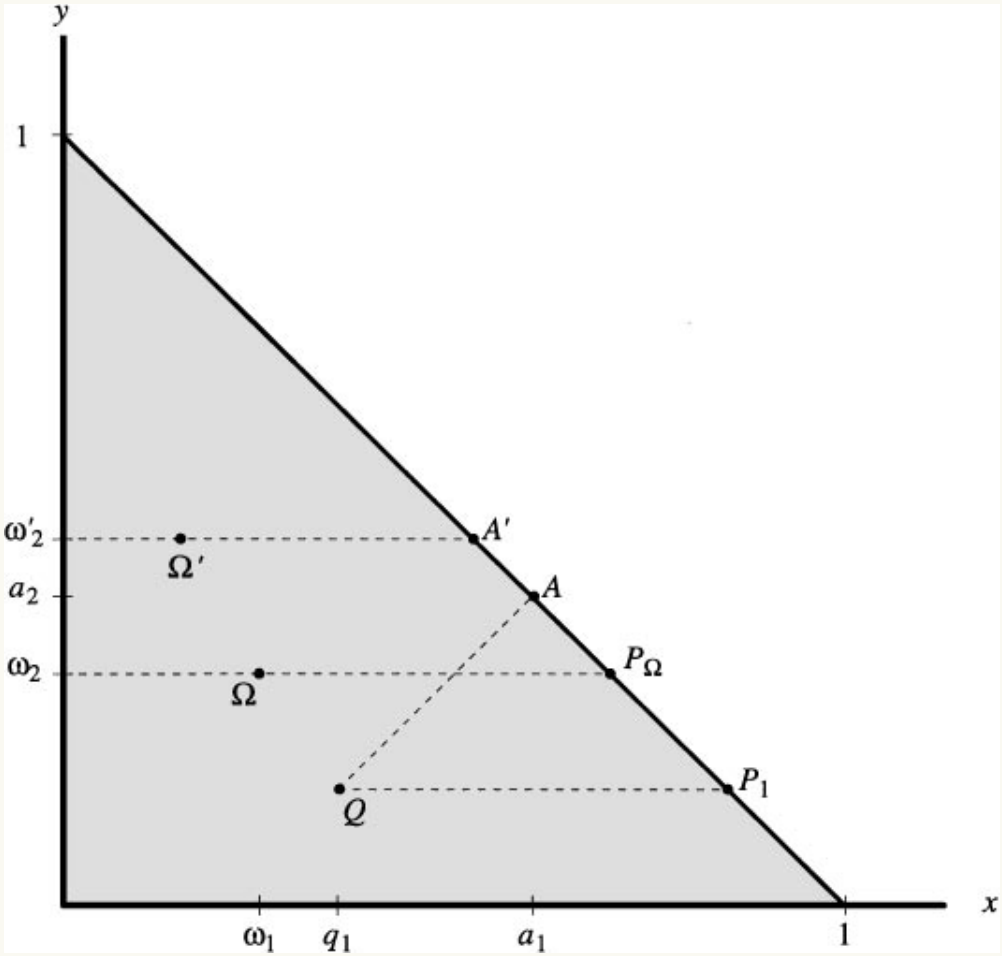

Figure 1 The bargaining problem.

Bargaining protocol

- Describes which players can make offers and in what order
- Specifies other actions that bargainers can take (e.g., an outside option that players can pursue after they terminate the bargaining)
- In Figure 1, point Ω denotes payoffs that are associated with outside option

Model Set-Up

- Two players decide how to divide a pie
- Players get nothing if they cannot agree on a division (i.e., $Q = (0, 0)$)
- Players take turns making offers and there is no limit on the number of offers (alternating-offer, infinite-horizon model)
- Players have complete information about bargaining setting and each other's payoffs

Solution

- Each player alternates between two roles, (i) making an offer and (ii) receiving an offer
- Let m be the equilibrium payoff to a player who is making an offer and r be the equilibrium payoff to a player who is receiving an offer
- Offerer must give to the receiver payoff $r = \delta m$ and can keep payoff $m = 1 - r$
- Solving these equations gives equilibrium payoffs

$$m^* = 1/(1+\delta)$$
$$r^* = \delta/(1+\delta)$$

- If time between offers becomes arbitrarily small, then $\delta \to 1$
- It follows that $(m, r) = (1/(1+\delta), \delta/(1+\delta))$ goes to $(1/2, 1/2)$
- Hence, as time between offers becomes very small, the players are in almost identical situations and have about the same bargaining power (therefore, they divide the pie in half)

- Suppose player 1 can make a take-it-or-leave-it offer; if player 2 rejects the offer, he obtains zero
  - In this case, player 1 claims all the surplus for herself by offering player 2 zero

- Suppose player 1 can make a take-it-or-leave-it offer; player 2 can accept or reject the offer or exercise an outside option that yields the payoffs associated with Ω
  - If player 2 did not have the outside option, player 1 would maximize her payoff by offering player 2 the smallest share that he would be willing to accept; therefore, player 1 would propose $P_1 = (1 - q_2, q_2)$
  - If player 2 has the outside option Ω, with $\omega_2 > q_2$, he can credibly claim to exercise the outside option if offered less than ω_2; therefore, player 1 proposes $P_\Omega = (1 - \omega_2, \omega_2)$

- Suppose that offers alternate; when considering an offer, a player can accept it, reject it in order to make a counteroffer, or exercise the outside option Ω
  - If the players did not have the outside option and if the time between offers was very short, the outcome would be A (divides the surplus evenly relative to status quo Q)
  - Note that both players prefer A to the outside option Ω; in this case, neither player can credibly threaten to exercise the outside option, so Ω has no effect on the outcome
  - However, if the outside option is Ω', then player 2 prefers the outside option to A; as player 2 can now credibly threaten to exercise the outside option, player 1 proposes $A' = (1 - \omega_2', \omega_2')$

Suppose

- Two states, S_1 and S_2, are bargaining about revising a territorial status quo (see Figure 2)
- S_1 controls all territory to the left of q, from which it obtains utility q
- S_2 controls all territory to the right of q, from which it derives utility $1 - q$
- Interval $[0, 1]$ defines the range of possible territorial agreements
- States receive utilities $U_1(x) = x$ and $U_2(x) = 1 - x$ from agreement $x \in [0, 1]$

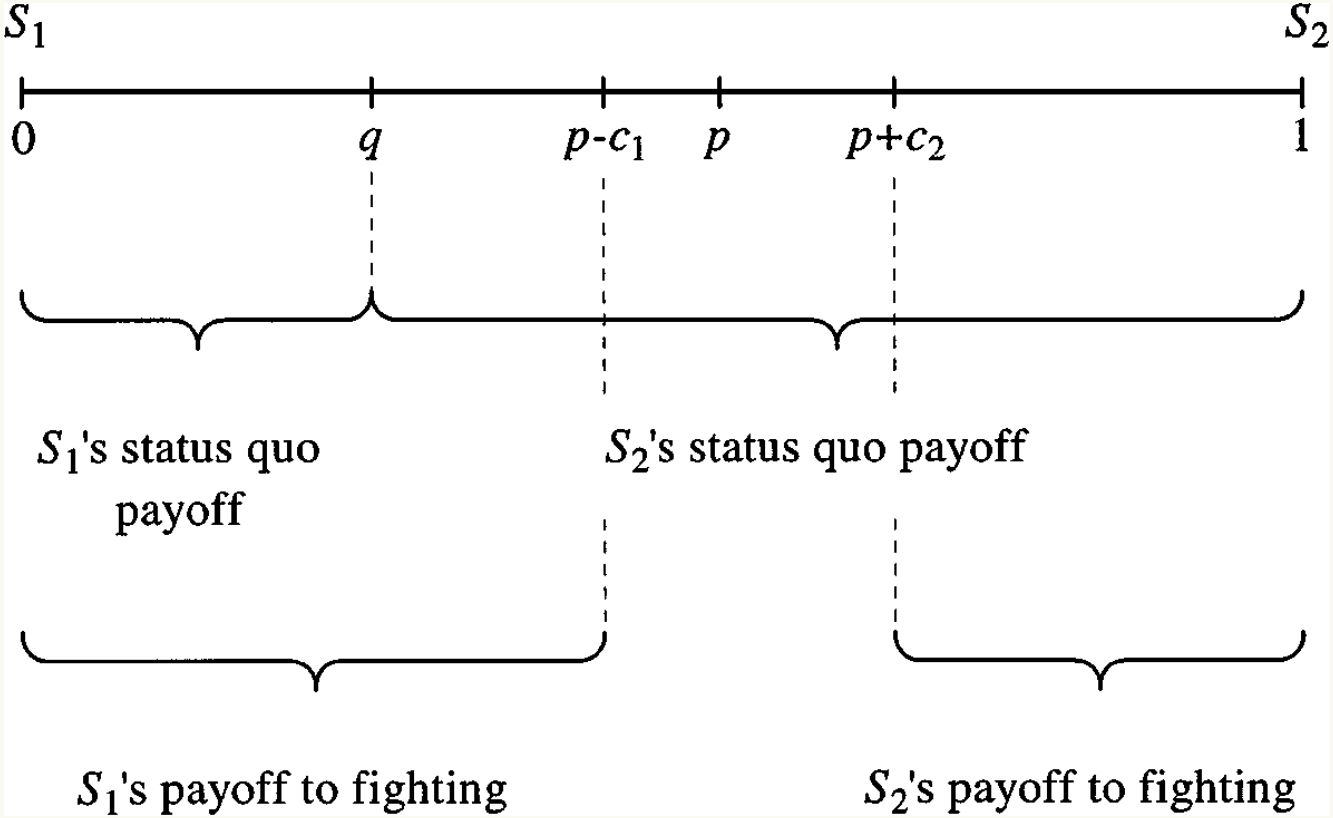

Figure 2 Bargaining over territory.

- In addition to revising the status quo through mutual agreement, states can also use war to reach a decision
- If they fight, S_1 pays cost c_1 and wins (respectively, loses) all territory with probability p (respectively, $1-p$); S_1's expected payoff to fighting is $p(1-c_1)+(1-p)(0-c_1)=p-c_1$
- S_2's expected payoff to fighting is $1-p-c_2$

- S_1 prefers fighting to accepting the status quo because $q < p - c_1$
- S_2 prefers the status quo to fighting because $q \leq p + c_2$
- The set of feasible peaceful agreements lies between $p - c_1$ and $p + c_2$ (territorial divisions that both states prefer to fighting)
- Figure 3 recasts this bargaining problem

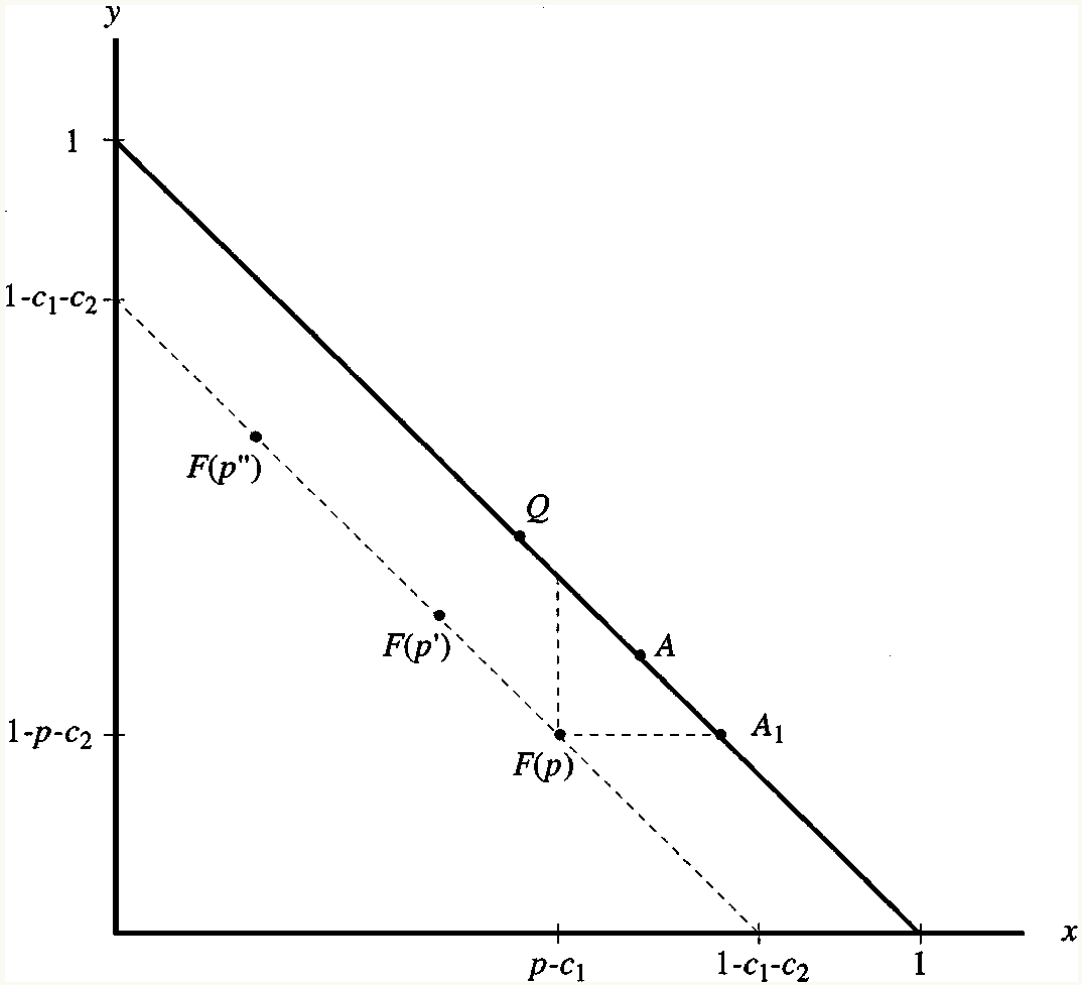

Figure 3 War as an outside option.

- In Figure 3, S_1's utility is plotted along the x-axis and S_2's utility is plotted along the y-axis
- The set of peaceful outcomes (including that status quo Q) is the line connecting $(1, 0)$ and $(0, 1)$ (this is the Pareto frontier of the bargaining problem)

- If the states fight, they obtain the payoffs at $F(p)$; this outcome lies inside the Pareto frontier, which reflects the fact that fighting is costly and therefore inefficient
- The allocations above and to the right of $F(p)$ are the peaceful outcomes that both states prefer to fighting
- As the distribution of power shifts in favor of S_2, e.g., from p to p' to p'' (where $p > p' > p''$), S_2's expected payoff to fighting increases, while S_1's expected payoff decreases

- A theory of war must explain why states fight (which leads to outcome $F(p)$) and why they do not reach a peaceful settlement that makes them both better off (e.g., outcome A)

- Most bargaining literature formalizes war as an outside option in the game
- Going to war is modeled as a game-ending move, with the payoffs reflecting the distribution of power and the states' costs of fighting

- Representing war as a costly lottery raises three issues
  - Modeling war as a costly lottery assumes away any further strategic interaction after states go to war
  - The costly-lottery assumption makes it impossible to answer questions about the strategic dynamics of inter-war behavior and war termination
  - Work on bargaining and war should help us understand the exercise of coercive power—be it economic, military, or political; but in order to understand also non-violent forms of coercion, it is important to relax the assumption that going to war is a game-ending move

Class Presentation

Matteo to present on Reiter (2003), “Exploring the Bargaining Model of War”

- The bargaining model of war views conflict as disagreements over the allocation of scarce goods
- States use both war and words as bargaining tools to achieve their optimal allocations of goods
- The bargaining model does not see war as a breakdown of diplomacy but as a continuation of bargaining

- Carl von Clausewitz (1976, 87): "[t]he political object is the goal, war is the means of reaching it, and means can never be considered in isolation from their purpose."

- Bargaining is the process of arriving at mutual agreement on the provision of a contract
- Wars are rarely total, they usually end with a war-terminating bargain rather than with one side's decisive military defeat
- Thomas Schelling (1960, 5): "most conflict situations are essentially *bargaining* situations."

- Early formal models of war incorporated an important simplification: war is not part of the bargaining process but an apolitical, two-outcome, costly lottery
  - It is apolitical in that no bargaining occurs during war
  - The only two possible outcomes are one side winning decisively or the other side winning decisively
  - War is costly because both sides must pay the costs of fighting regardless of who wins, so there are fewer goods to distribute between the two sides after war than before

- Later formal models relaxed the assumption that war is a costly lottery (bargaining takes place during, before, and after war)
- Reiter terms this latter perspective the bargaining model of war

- Newest research on bargaining models covers all phases of war:
  - Fighting starts when two sides cannot reach a bargain that both prefer to war
  - Each side fights to improve its chances of getting a desirable settlement of the dispute
  - War ends when the two sides strike a bargain that both prefer to continuing the war
  - Duration of peace following the war reflects the willingness of both sides not to break the war-ending bargain

- War is costly
- Therefore, if two states in dispute know the outcome of a possible war, they should prefer to reach a bargain that reflects the hypothetical postwar settlement (rather than fighting, reaching the same settlement, and suffering the costs of war)

- According to Fearon (1995), there are three conditions under which war is possible
  - Private information about relative military capability or resolve and an incentive to keep this private information secret
  - Inability to commit not to fight in the future
  - Indivisibility of an item under dispute might prevent the two sides from reaching a mutually acceptable prewar bargain

- An armed force engaged in combat tries to accomplish one or more of three immediate tasks
  - Destruction of military forces
  - Occupation of territory
  - Destruction of civilian assets
- The bargaining model proposes that military means are used as part of the bargaining process, to advance political ends

- There are two separate means by which combat can accomplish political goals within the bargaining model
  - Combat can seek total conquest in order to achieve victory in an absolute war
  - Combat can reduce uncertainty about the capabilities or resolve of the combatants
- One explanation of the outbreak of war is uncertainty about the outcome of a hypothetical war
- Combat can reduce such uncertainty by providing information about the actual balance of power or resolve, which increases the likelihood of reaching an agreement both sides prefer over continued fighting

- The bargaining model helps explain the consequences of war, specifically the stability of a postwar peace
- Two hypotheses have emerged
  - Wars are about the revelation of information about power and capabilities, and the end of war creates a readjustment of goods consistent with a new understanding of the distribution of power
  - The more battles are fought, the more information is revealed, causing the expectations of the two sides to converge; and the greater the convergence of expectations about capabilities, the more stable the postwar peace will be

- There is some empirical support for the bargaining model (see p. 32)
- However, the core of the bargaining model remains to be tested; this requires examination of three factors:
  - Estimates of capabilities
  - Estimates of resolve
  - The exchange of offers between two sides

- The bargaining model overlaps with deterrence theory
- However, the bargaining model does make one important different prediction: while deterrence theory predicts that war becomes more likely as the imbalance of power between two states grows, the bargaining model argues that it is disagreement over the balance of power that causes war (and as balance of power is associated with more uncertainty about the outcome of a war, it should make war more likely)

- The spiral model forecasts two principal paths to war: preventive war and preemptive war
- Both types of war fit into the bargaining model

- The bargaining model proposes that as two sides reveal information about their capabilities and intentions, bargaining space opens up to permit a war-avoiding bargain
- The cognitive-psychological school would doubt that such revelations preserve peace; for example, leaders' images of other countries as hostile will preserve even in the face of credible evidence to the contrary

- Organization theory offers a number of critiques of the bargaining model:
  - Beliefs about preferences and capabilities are filtered through organizations, frequently militaries; this might introduce systematic bias into the formation of beliefs, for example because militaries tend to view adversaries as intractably hostile
  - The bargaining model usually assumes that the likelihood of one side winning a battle remains constant throughout the war, and termination of the war is made possible by reducing uncertainty about that constant probability; however, entrepreneurship can lead to changes in military capabilities and strategy, thus slowing the convergence of expectations

- Most applications of the bargaining model treat states as unitary actors; war is seen as a puzzle because both sides are better off striking a political settlement instead of fighting to reach the same settlement and pay the costs of fighting
- However, some domestic-politics theories posit that leaders may prefer fighting over reaching a peaceful settlement; they may engage in conflict to divert public concern from internal problems, rallying citizens around the flag to increase support of the leadership

- According to constructivism, war is best understood as a social convention determined and shaped by norms and culture, not as a rationalist choice reflecting costs and benefits
- Some constructivist theories posit that fighting serves social functions, principally the formation of group identity; for example, states may seek war not just to acquire goods, but as an end in itself to generate and reinforce national identity