

# **MODELS, NUMBERS, AND CASES**

Methods for Studying International Relations

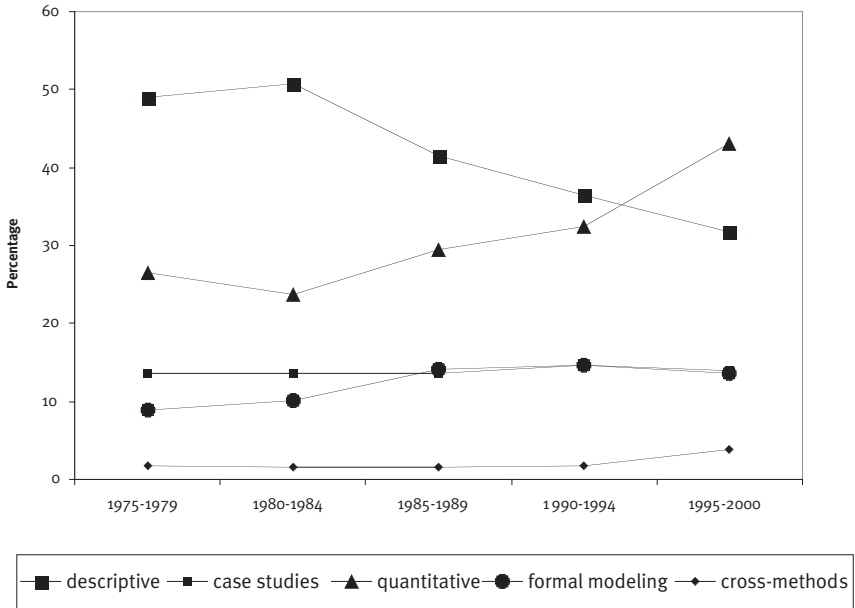
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## Models, Numbers, and Cases



**Fig. 1. Trends in methodology of international relations research (1975–2000).**

(Data from *American Political Science Review*, vols. 69–94; *International Organization*, vols. 29–54; *International Security*, vols. 1–25; *International Studies Quarterly*, vols. 19–44; *Journal of Conflict Resolution*, vols. 19–44; and *World Politics*, vols. 27–52.)

**TABLE 1. Organization of the Book**

| Methodological Domain               | Introductory Chapter                    | International Political Economy                  | International Environmental Politics              | International Security         |
|-------------------------------------|---|--|---|--------------------------------|
| Part I:<br>Case Study<br>Methods    | Bennett<br>(chap. 2)                    | Odell<br>(chap. 3)                               | Mitchell and<br>Bernauer<br>(chap. 4)             | Kacowicz<br>(chap. 5)          |
| Part II:<br>Quantitative<br>Methods | Braumoeller<br>and Sartori<br>(chap. 6) | Mansfield<br>(chap. 7)                           | Sprinz<br>(chap. 8)                               | Huth and<br>Allee<br>(chap. 9) |
| Part III:<br>Formal<br>Methods      | Snidal<br>(chap. 10)                    | Milner<br>(chap. 11),<br>Conybeare<br>(chap. 12) | Kilgour and<br>Wolinsky-<br>Nahmias<br>(chap. 13) | Kydd<br>(chap. 14)             |

**TABLE 1. Equivalent Terms for Types of Case Studies**

| <b>Arend Lijphart</b>                  | <b>Harry Eckstein</b>                         |
|--|---|
| Atheoretical case study                | Configurative-ideographic case study          |
| Interpretative case study              | Disciplined-configurative case study          |
| Hypothesis-generating case study       | Heuristic case study                          |
| Deviant case study                     | (No comparable term or concept)               |
| Theory-confirming/infirming case study | Crucial, most likely, least likely test cases |

**TABLE 1. Criteria for High Quality QER Research**

| Criteria             | Question  |
|----------------------|---|
| Construct validity   | Does the collected empirical information accurately capture the concepts or variables contained in the theoretical model or propositions nominally being investigated?  |
| Internal validity    | Does the analytic method demonstrate that, for each hypothesized causal relationship, observed variation in the independent variable correlates with observed variation in the dependent variable, and that no other variables provide a more plausible explanation of variation in the dependent variable? |
| External validity    | Has the researcher accurately identified the boundary between the class of cases to which the findings can be validly generalized and beyond which valid generalizations are unlikely?  |
| Reliability          | Could other researchers replicate the research techniques used, e.g., data collection and analytic methods, and, having done so, arrive at the same results?  |
| Progressive research | Does the research contribute to a larger, cumulative research program?  |

**TABLE 1. Relationship between Y and X**

| Y                | Coef. | S.E.  | t    | P >  t                             | 95% Conf. Interval |       |
|------------------|-------|-------|------|------------------------------------|--------------------|-------|
| X                | 0.500 | 0.118 | 4.24 | 0.002                              | 0.233              | 0.767 |
| Constant         | 3.000 | 1.125 | 2.67 | 0.026                              | 0.455              | 5.545 |
| <i>n</i> = 11    |       |       |      | <i>R</i> <sup>2</sup> = 0.667      |                    |       |
| F(1,9) = 17.98   |       |       |      | Adj. <i>R</i> <sup>2</sup> = 0.629 |                    |       |
| Prob > F = 0.002 |       |       |      | Root MSE = 1.237                   |                    |       |

Source: From Anscombe (1973)

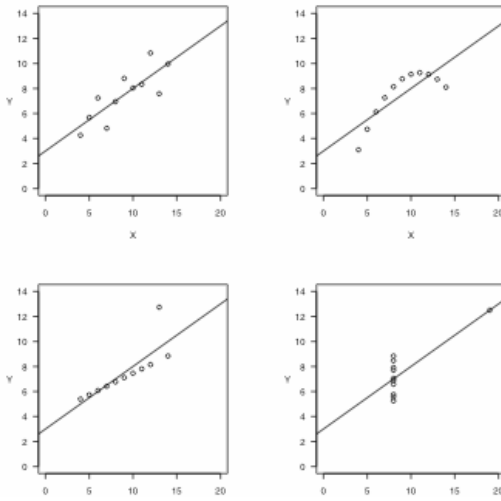


Fig. 1. Four data sets consistent with results in table 1



**TABLE 2. A Significant Regression Coefficient with 50,000 Observations**

| <i>Y</i> | Coef.  | S.E.  | <i>t</i> | <i>P</i> >   <i>t</i> | 95% Conf. Interval |       |
|----------|--------|-------|----------|-----------------------|--------------------|-------|
| <i>X</i> | 0.013  | 0.004 | 2.94     | 0.003                 | 0.004              | 0.022 |
| Constant | 0.0007 | 0.004 | 0.15     | 0.881                 | -0.008             | 0.010 |

|                         |                                     |
|-------------------------|-------------------------------------|
| <i>N</i> = 50,000       | <i>R</i> <sup>2</sup> = 0.0002      |
| F(1,49998) = 8.64       | Adj. <i>R</i> <sup>2</sup> = 0.0002 |
| Prob > <i>F</i> = 0.003 | Root MSE = 1.0018                   |

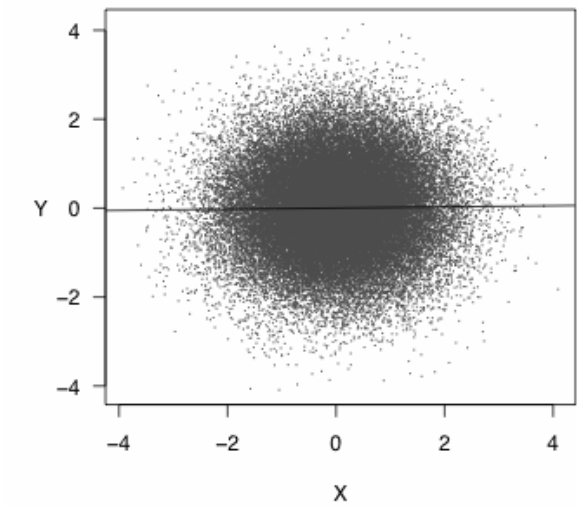
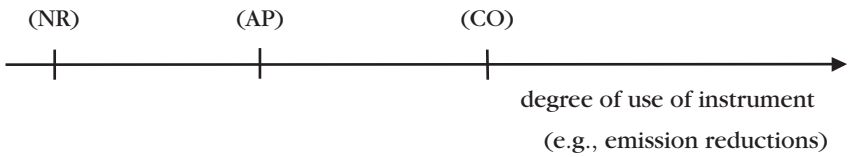


Fig. 2. Scatterplot of data summarized in table 2, with estimated regression line



**Fig. 1. Measuring regime effectiveness.**

Effectiveness score:  $ES = (AP - NR) / (CO - NR)$ . (NR = no-regime counterfactual, CO = collective optimum, AP = actual performance. Source: Helm and Sprinz 2000.)

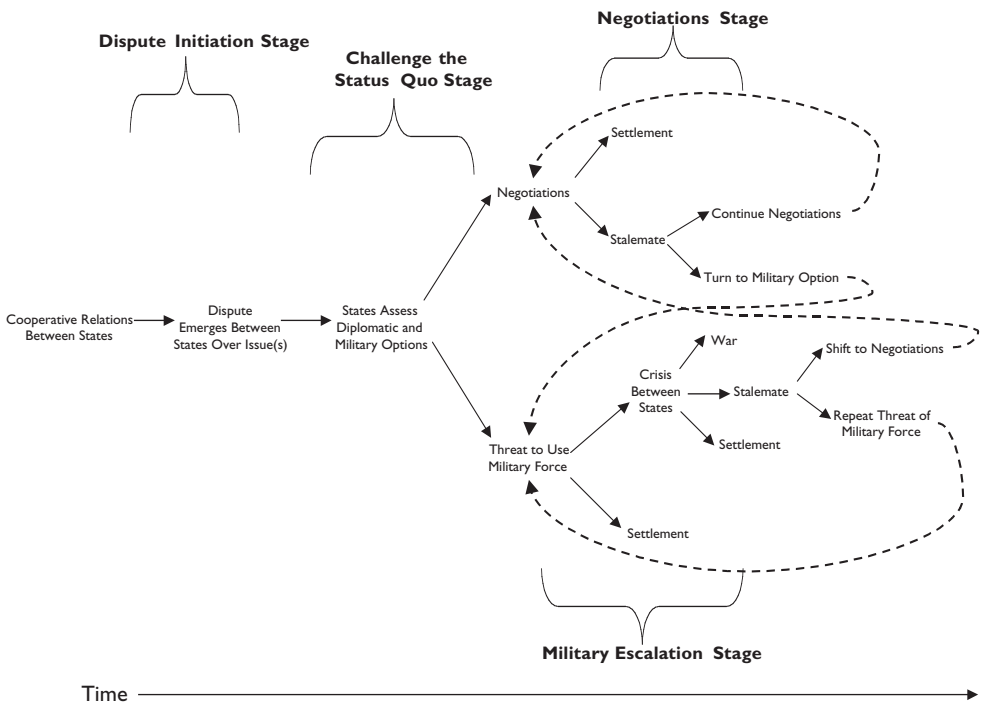
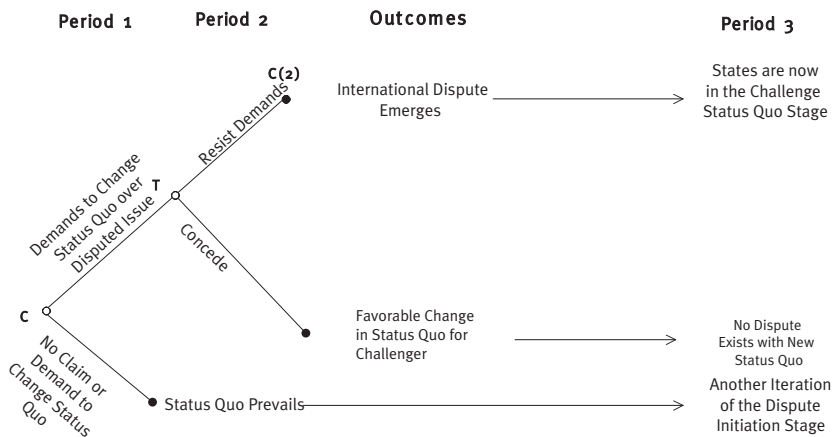
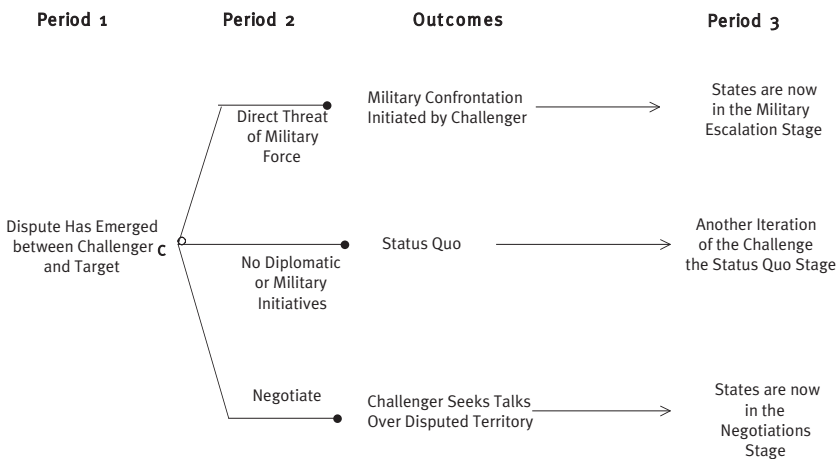


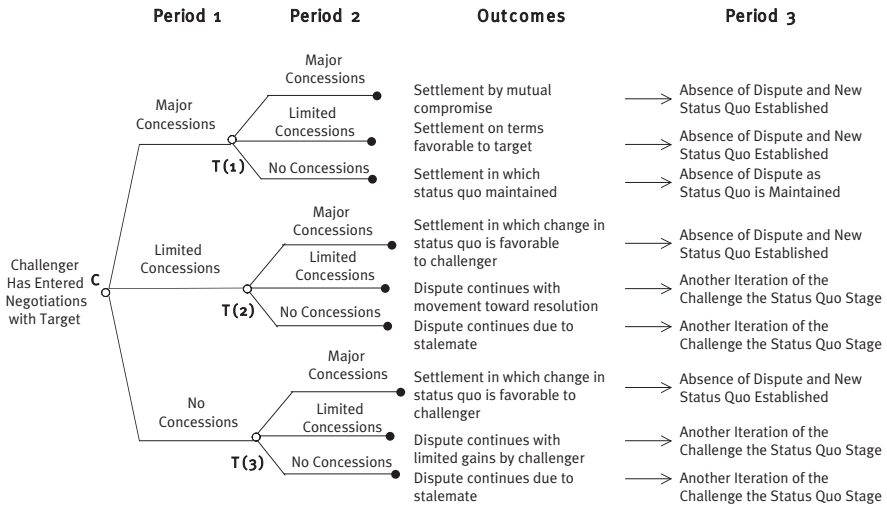
Fig. 1. The evolution of international disputes



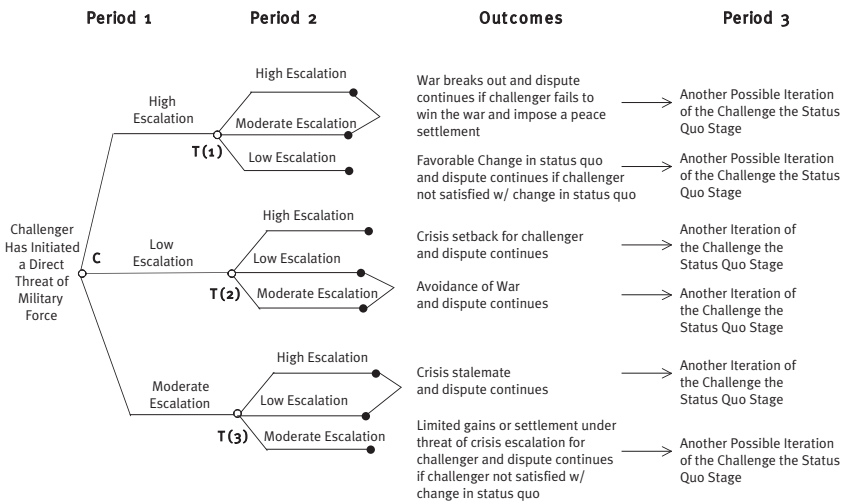
**Fig. 2. The Dispute Initiation stage**  
 (Note: C = Challenger State; T = Target State)



**Fig. 3. The Challenge the Status Quo stage**  
 (Note: C = Challenger State; T = Target State)



**Fig. 4. The Negotiations stage**  
 (Note: C = Challenger State; T = Target State)



**Fig. 5. The Military Escalation stage**  
 (Note: C = Challenger State; T = Target State)

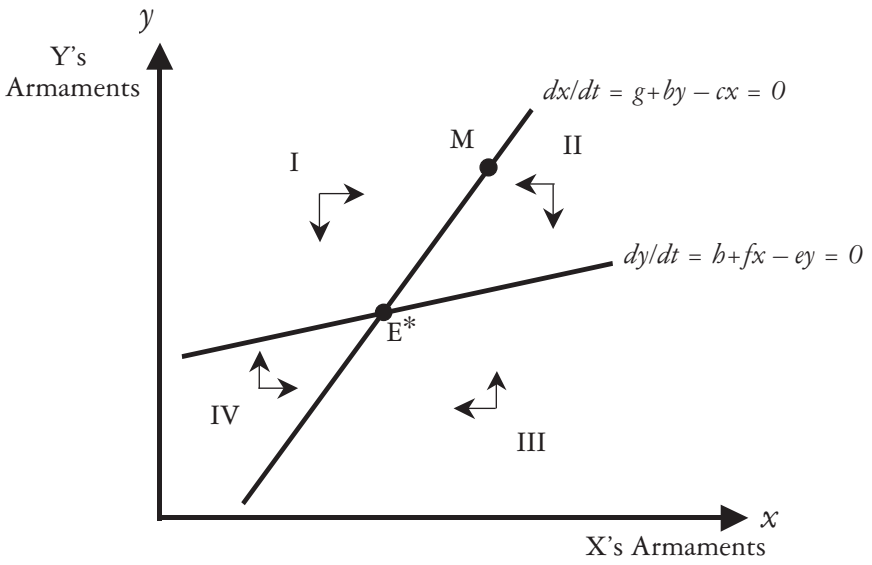


Fig. 1a. Stable Richardson arms race

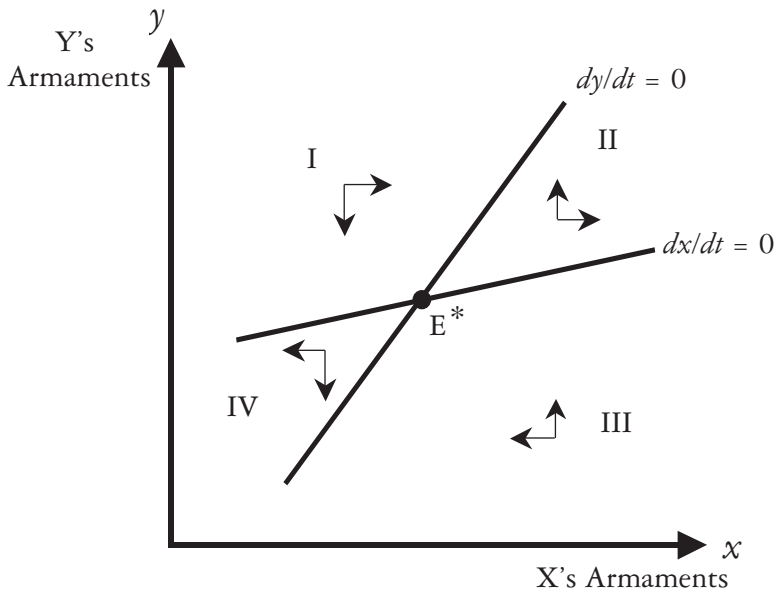


Fig. 1b. Unstable Richardson arms race



|         |                                | State Y                  |                                |
|---------|--------------------------------|--------------------------|--------------------------------|
|         |                                | Cooperate<br>No New Arms | Not Cooperate<br>Increase Arms |
| State X | Cooperate<br>No New Arms       | 3, 3                     | 1, 4                           |
|         | Not Cooperate<br>Increase Arms | 4, 1                     | 2, 2*                          |

Fig. 2. Arms race as a Prisoners' Dilemma

|         |        | State Y |        |        |
|---------|--------|---------|--------|--------|
|         |        | Low     | Medium | High   |
| State X | High   | 3, 6 *  | 4, 4   | 2, 2   |
|         | Medium | 1, 2    | 5, 5 * | 4, 4   |
|         | Low    | 0, 0    | 1, 2   | 6, 3 * |

Fig. 3. Multiple cooperative equilibria

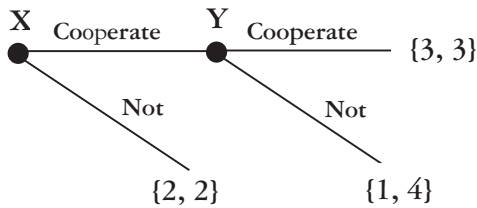


Fig. 4. Extensive form of Trust Game

|   |               |           |               |
|---|---------------|-----------|---------------|
|   |               | Y         |               |
|   |               | Cooperate | Not Cooperate |
| X | Not Cooperate | 2, 2      | 2, 2*         |
|   | Cooperate     | 3, 3      | 1, 4          |

Fig. 5. Normal form of Trust Game

|   |                       |           |               |
|---|-----------------------|-----------|---------------|
|   |                       | Y         |               |
|   |                       | Cooperate | Not Cooperate |
| X | Not Cooperate         | 2, 2      | 2, 2*         |
|   | Cooperate             | 3, 3      | 1, 4          |
|   | Cooperate with Threat | 3, 3*     | 1-c, 4-p      |

Fig. 6. Normal form of Threat Game

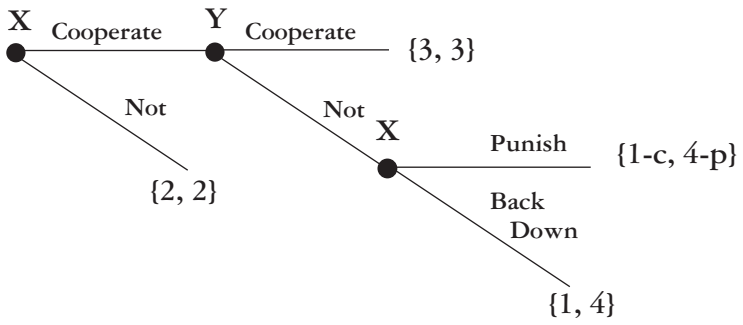


Fig. 7. Extensive form of Threat Game

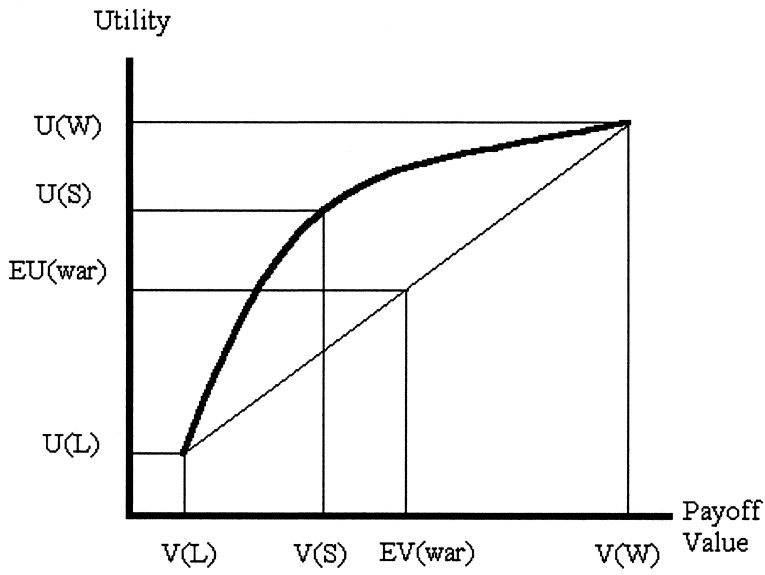
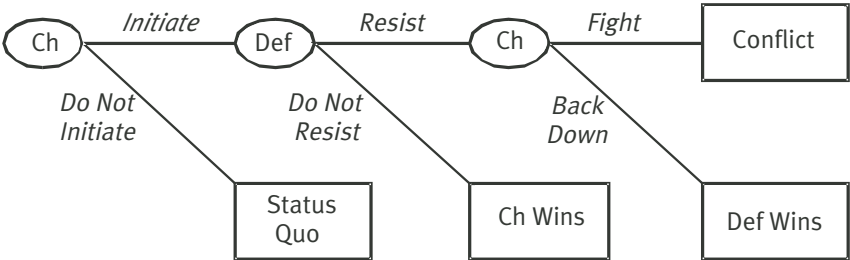


Fig. 1. Expected utility and war



**Fig. 1. Asymmetric Deterrence Game**  
(Adapted from Zagare and Kilgour 2000.)

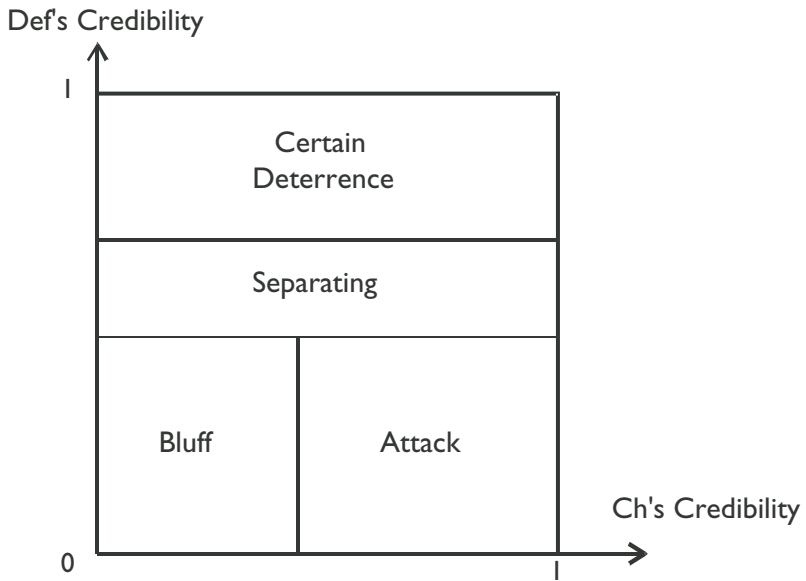


Fig. 2. Perfect Bayesian equilibria of Asymmetric Deterrence Game (Adapted from Zagare and Kilgour 2000.)

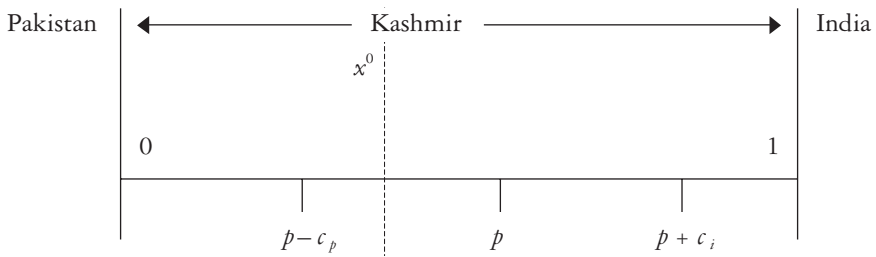


Fig. 1. The bargaining range

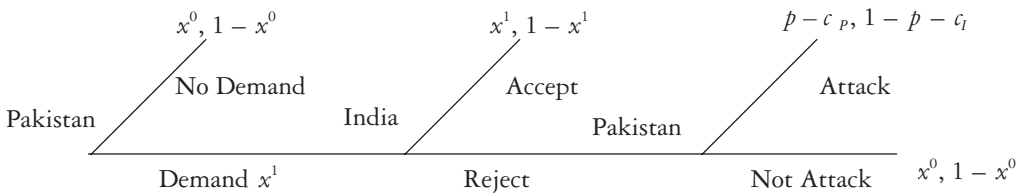


Fig. 2. The game tree (complete information)



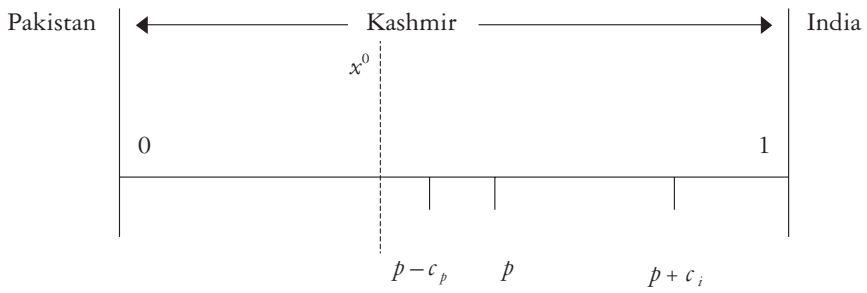


Fig. 3. The new bargaining range

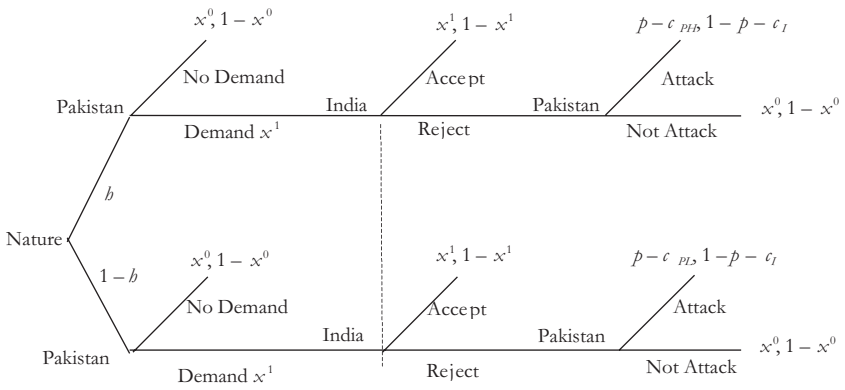
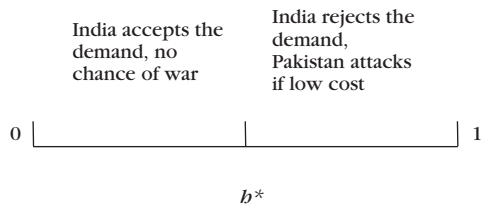


Fig. 4. The game tree (incomplete information)



$b$ : the likelihood that Pakistan has high costs for fighting

Fig. 5. War in the incomplete information bargaining game