You can access the slides through the QR code below

or www.yujimasumura.com

A Theory of Cost-Sharing Negotiations of Alliances

Yuji Masumura

Department of Government
University of Texas at Austin

Jan. 24, 2025

FP LATEST | TRENDING: Is capitalism broken? | Middle East crisis

EXCLUSIVE: Trump Asks Tokyo to Quadruple Payments for U.S. Troops i

EXCLUSIVE

Trump Asks Tokyo to Quadruple Payments for U.S. Troops in Japan

The move is part of the administration's campaign to get U.S. allies to pay more for defense. South Korea is also being asked to pony up.

By Lara Seligman and Robbie Gramer

Introduction

- In Nov. 2019, Trump asked Tokyo to pay four times as much to offset the costs of US forces in Japan

Introduction

- In Nov. 2019, Trump asked Tokyo to pay four times as much to offset the costs of US forces in Japan
- Japan pays $2 billion/year

Introduction

- In Nov. 2019, Trump asked Tokyo to pay four times as much to offset the costs of US forces in Japan
- Japan pays $2 billion/year
- The majority of these costs are for utility bills, salaries of general workers at US bases, and houses for US soldiers

Introduction

- Literature: alliances as costly signaling (Morrow 1994, 2000; Smith 1994)

Introduction

- Literature: alliances as costly signaling (Morrow 1994, 2000; Smith 1994)
- A patron should incur enough costs to have a deterrence effect

Introduction

- Literature: alliances as costly signaling (Morrow 1994, 2000; Smith 1994)
- A patron should incur enough costs to have a deterrence effect
- Cost-sharing should weaken deterrence

Introduction

- Literature: alliances as costly signaling (Morrow 1994, 2000; Smith 1994)
- A patron should incur enough costs to have a deterrence effect
- Cost-sharing should weaken deterrence
- b/c cost-sharing makes alliances close to cheap talk

Introduction

- Literature: alliances as costly signaling (Morrow 1994, 2000; Smith 1994)
- A patron should incur enough costs to have a deterrence effect
- Cost-sharing should weaken deterrence
- b/c cost-sharing makes alliances close to cheap talk
- states claim something opposite

In 2021, Japanese Foreign Minister says, "(the agreement) increases the credibility of the alliance"

the US says that the cost-sharing by the Japanese government "serves as a pillar of the Alliance"

Introduction

RQ: Why do protégés agree to pay and how do these negotiations affect deterrence?

Introduction

RQ: Why do protégés agree to pay and how do these negotiations affect deterrence?

Argument in a nutshell:

Both success and failure help sustain deterrence, but in different ways

Introduction

RQ: Why do protégés agree to pay and How do these negotiations affect deterrence?

Argument in a nutshell:

Both success and failure help sustain deterrence, but in different ways

Introduction

RQ: Why do protégés agree to pay and How do these negotiations affect deterrence?

Argument in a nutshell:

Both success and failure help sustain deterrence, but in different ways

- successful cost-sharing has a negative impact on signaling
- But allies keep high deterrence by reducing the costs and ensuring a capability boost
- allies prioritize such a boost over signaling

Game

- Three Players: Ally (A), Target (T), and Challenger (C) ($i = \{A, T, C\}$)

Game

- Three Players: Ally (A), Target (T), and Challenger (C) ($i = \{A, T, C\}$)
- T and C have a conflict over an issue, of which value is 1 for them and $\beta \in (0, 1)$ for A

Game

- Three Players: Ally (A), Target (T), and Challenger (C) ($i = \{A, T, C\}$)
- T and C have a conflict over an issue, of which value is 1 for them and $\beta \in (0, 1)$ for A
- Uncertainty over $\beta \in (\overline{\beta}, \underline{\beta})$. A and T are informed.

Game

- Three Players: Ally (A), Target (T), and Challenger (C) ($i = \{A, T, C\}$)
- T and C have a conflict over an issue, of which value is 1 for them and $\beta \in (0, 1)$ for A
- Uncertainty over $\beta \in (\overline{\beta}, \underline{\beta})$. A and T are informed.
- A and T have an alliance, which costs $\pi > 0$ for A

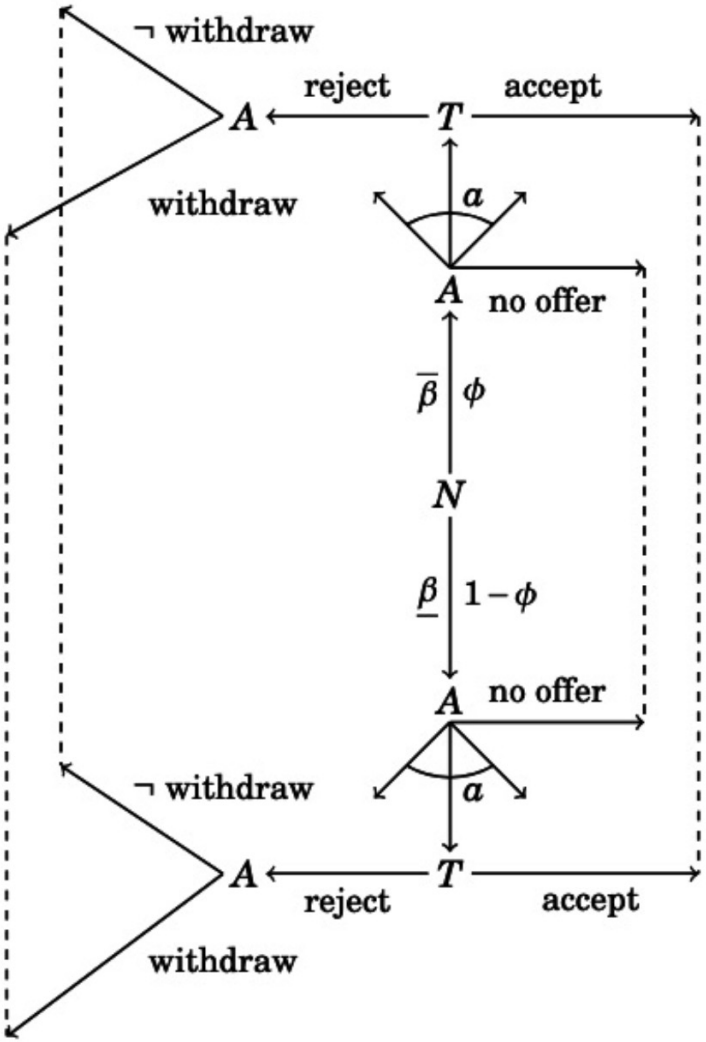
Game

- Three Players: Ally (A), Target (T), and Challenger (C) ($i = \{A, T, C\}$)
- T and C have a conflict over an issue, of which value is 1 for them and $\beta \in (0, 1)$ for A
- Uncertainty over $\beta \in (\overline{\beta}, \underline{\beta})$. A and T are informed.
- A and T have an alliance, which costs $\pi > 0$ for A
- The alliance increases the prob. of winning (a capability boost)

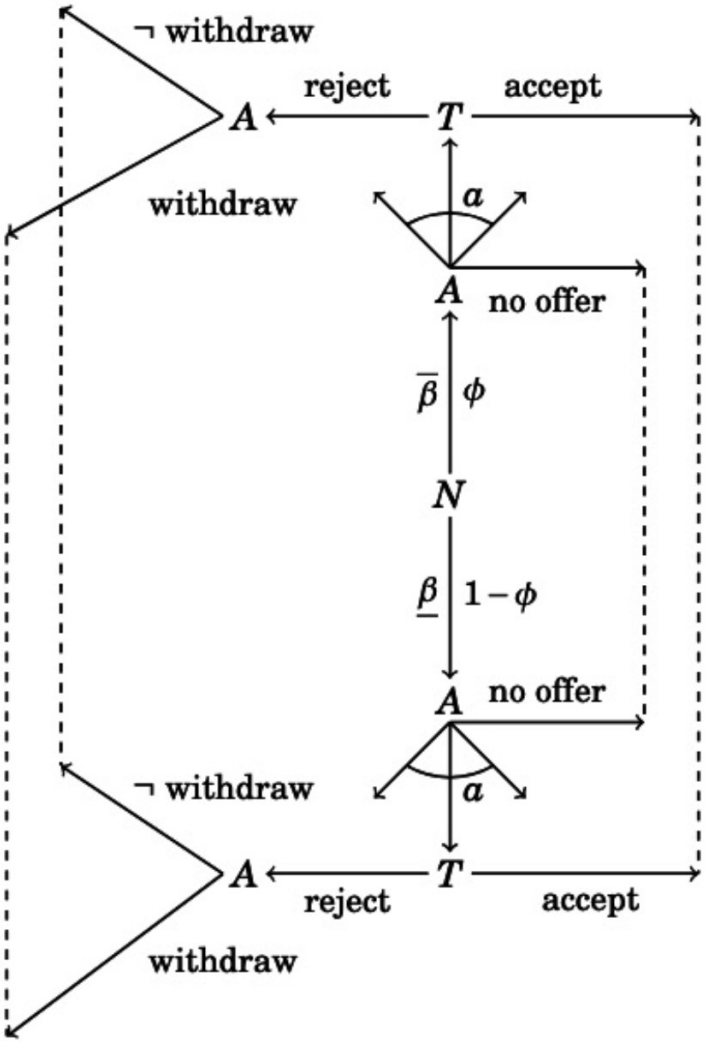
Game

- Three Players: Ally (A), Target (T), and Challenger (C) ($i = \{A, T, C\}$)
- T and C have a conflict over an issue, of which value is 1 for them and $\beta \in (0, 1)$ for A
- Uncertainty over $\beta \in (\overline{\beta}, \underline{\beta})$. A and T are informed.
- A and T have an alliance, which costs $\pi > 0$ for A
- The alliance increases the prob. of winning (a capability boost)
- Two stages: (1) a cost-sharing negotiation and (2) crisis bargaining

Game: the cost-sharing negotiation stage

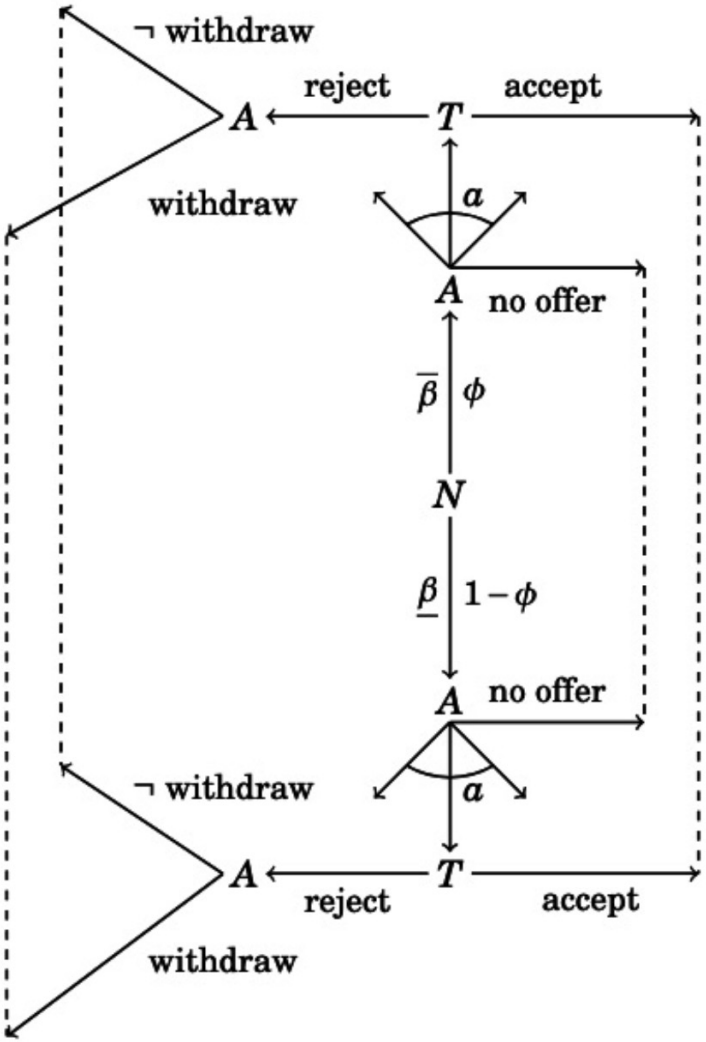


Game: the cost-sharing negotiation stage



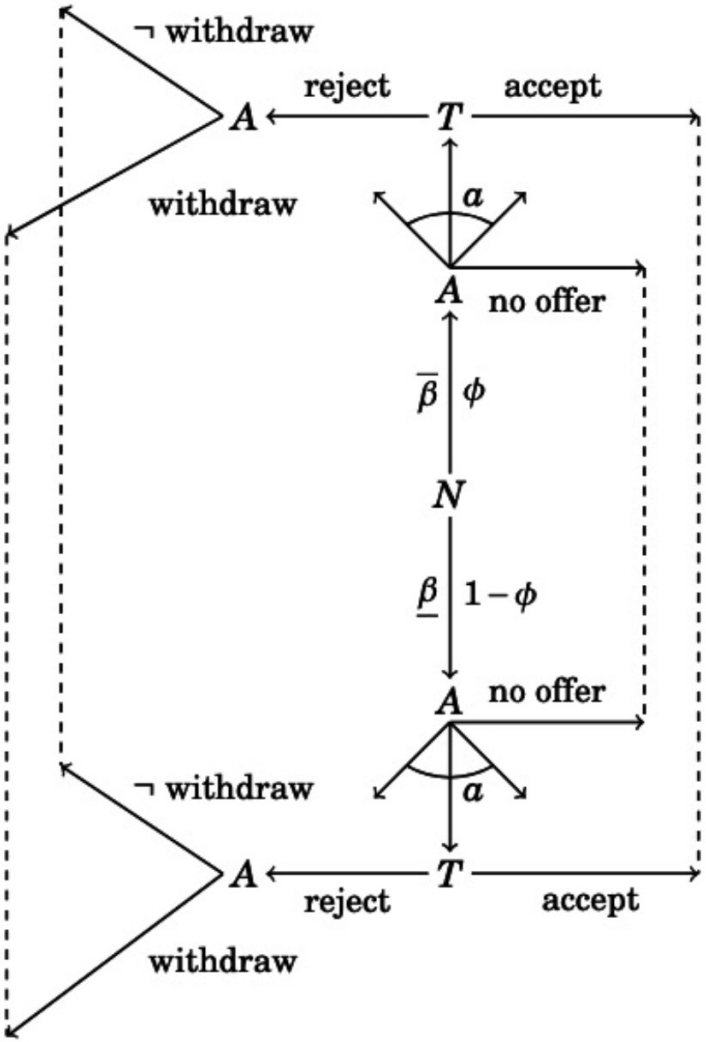
- N choose A's type: committed ($\overline{\beta}$) with ϕ or uncommitted ($\underline{\beta}$) with $1-\phi$ ($\phi \in (0,1)$)

Game: the cost-sharing negotiation stage



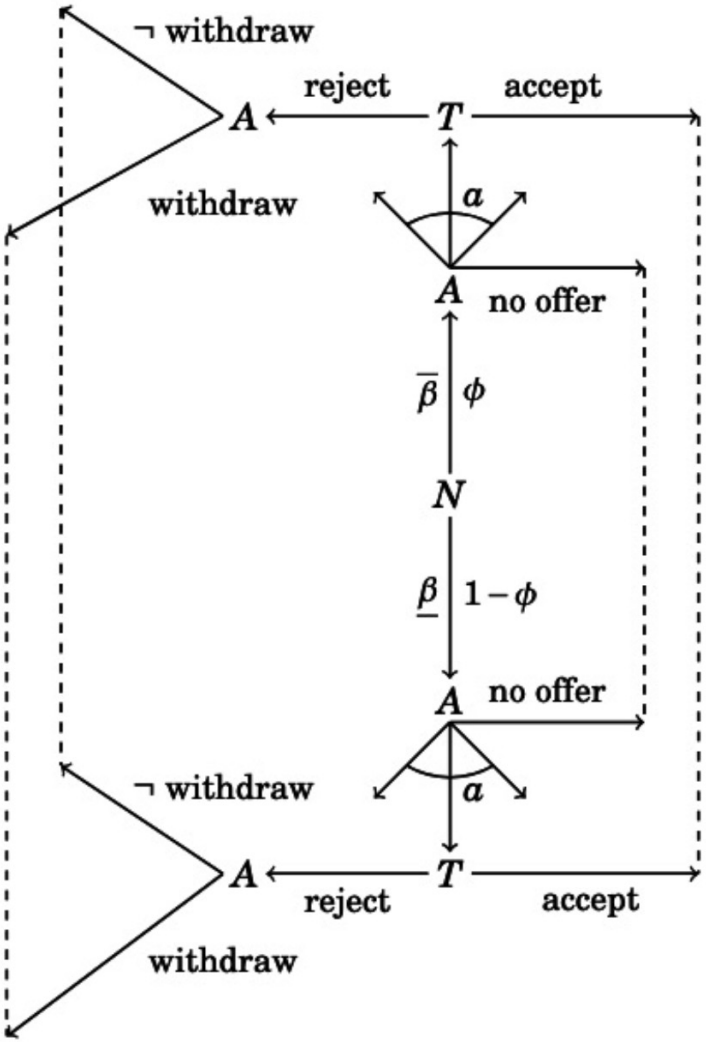
- N choose A's type: committed ($\overline{\beta}$) with ϕ or uncommitted ($\underline{\beta}$) with $1-\phi$ ($\phi \in (0,1)$)
- A decides if it makes a cost-sharing offer, $a \in (0, \overline{a})$ or "no offer"

Game: the cost-sharing negotiation stage



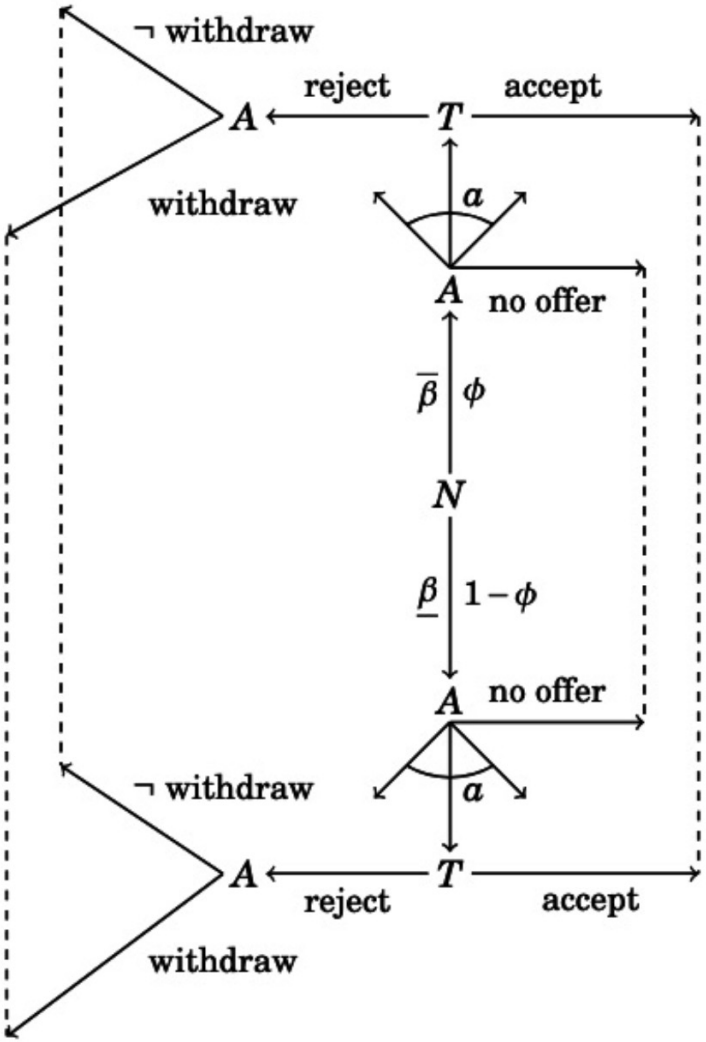
- N choose A's type: committed ($\overline{\beta}$) with ϕ or uncommitted ($\underline{\beta}$) with $1-\phi$ ($\phi \in (0,1)$)
- A decides if it makes a cost-sharing offer, $a \in (0, \overline{a})$ or "no offer"
- A gets la from domestic politics, where $l \in (-1,1)$ is the level of isolationism

Game: the cost-sharing negotiation stage



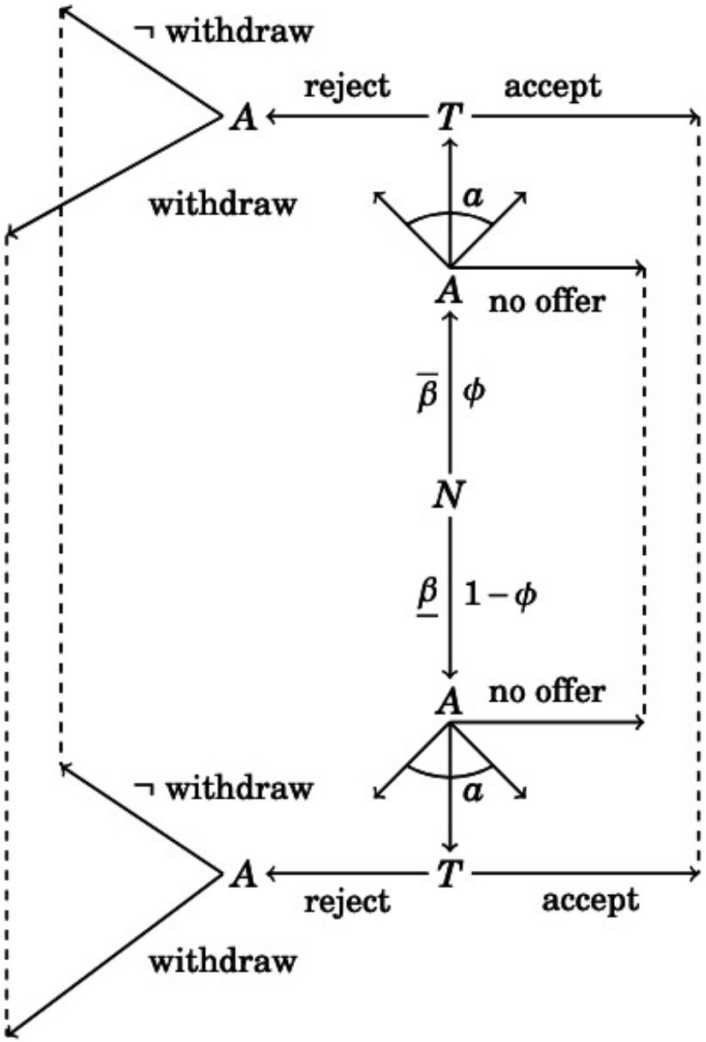
- N choose A's type: committed ($\overline{\beta}$) with ϕ or uncommitted ($\underline{\beta}$) with $1-\phi$ ($\phi \in (0,1)$)
- A decides if it makes a cost-sharing offer, $a \in (0, \overline{a})$ or "no offer"
- A gets la from domestic politics, where $l \in (-1,1)$ is the level of isolationism
- T accepts or rejects a

Game: the cost-sharing negotiation stage



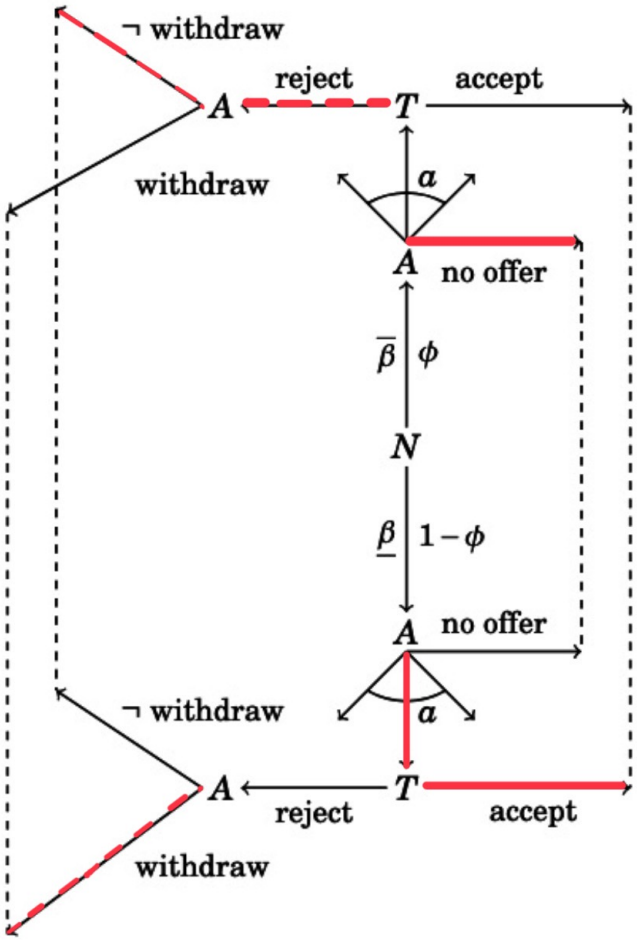
- N choose A's type: committed ($\overline{\beta}$) with ϕ or uncommitted ($\underline{\beta}$) with $1-\phi$ ($\phi \in (0,1)$)
- A decides if it makes a cost-sharing offer, $a \in (0, \overline{a})$ or "no offer"
- A gets la from domestic politics, where $l \in (-1,1)$ is the level of isolationism
- T accepts or rejects a
- If T accepts, the alliance is kept ("sharing")

Game: the cost-sharing negotiation stage



- N choose A's type: committed ($\overline{\beta}$) with ϕ or uncommitted ($\underline{\beta}$) with $1-\phi$ ($\phi \in (0,1)$)
- A decides if it makes a cost-sharing offer, $a \in (0, \overline{a})$ or "no offer"
- A gets la from domestic politics, where $l \in (-1,1)$ is the level of isolationism
- T accepts or rejects a
- If T accepts, the alliance is kept ("sharing")
- If T rejects, A chooses to withdraw from the alliance ("withdrawal") or remain in the alliance ("free-riding")

Equilibrium 1



Proposition (Separating Equilibrium 1)

When

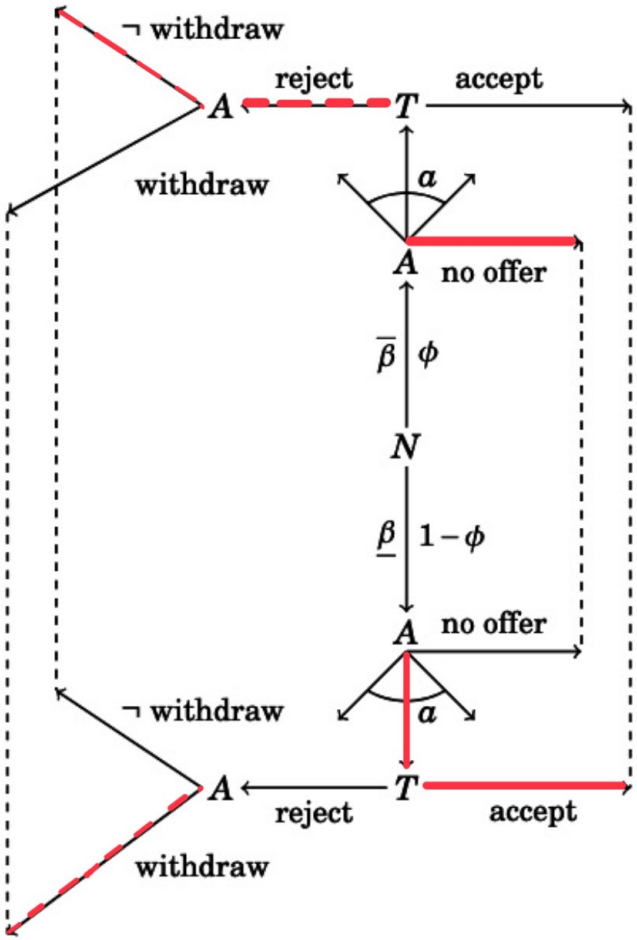
$$I < 0$$

$$\underline{\beta}(p_h - p_l) < \pi < \overline{\beta}(p_h - p_m - c_T) + c_A,$$

, and other conditions,

- *the committed A does not make an offer*
- *the uncommitted A offers* $a^* = p_h - p_l$*, and T accepts*

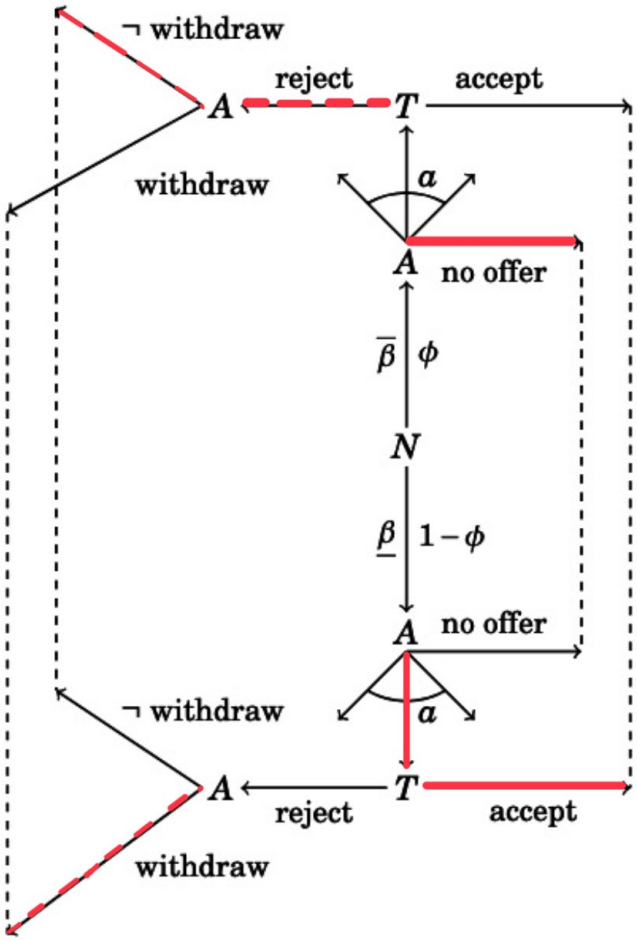
Equilibrium 1



Implications

- A credible threat of abandonment is key for successful cost-sharing negotiations

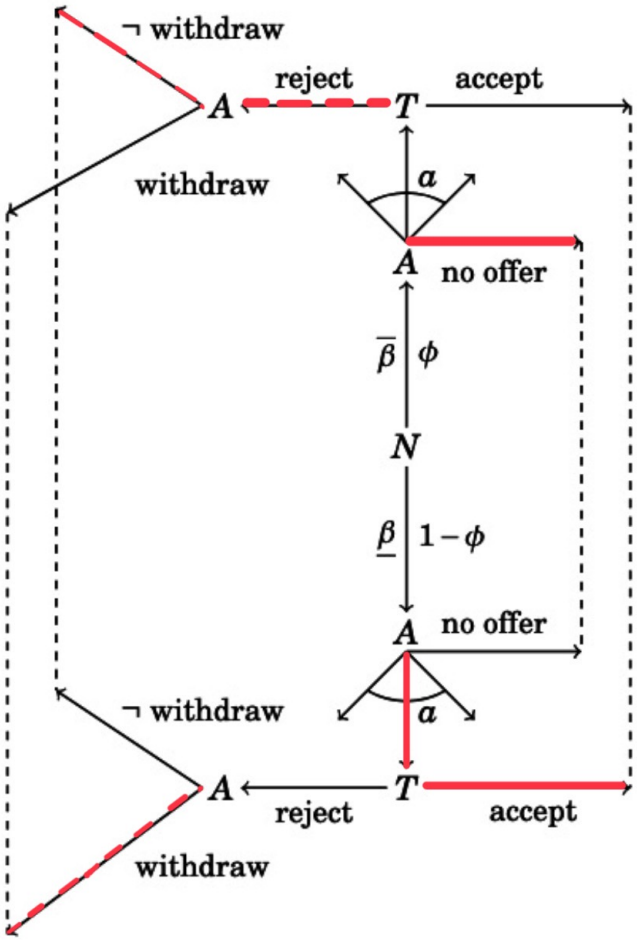
Equilibrium 1



Implications

- A credible threat of abandonment is key for successful cost-sharing negotiations
- A successful negotiation is a sign of an uncommitted patron

Equilibrium 1



Implications

- A credible threat of abandonment is key for successful cost-sharing negotiations
- A successful negotiation is a sign of an uncommitted patron
- A successful negotiation maintains deterrence by prioritizing a capability boost of alliances over signaling

Japan 1978

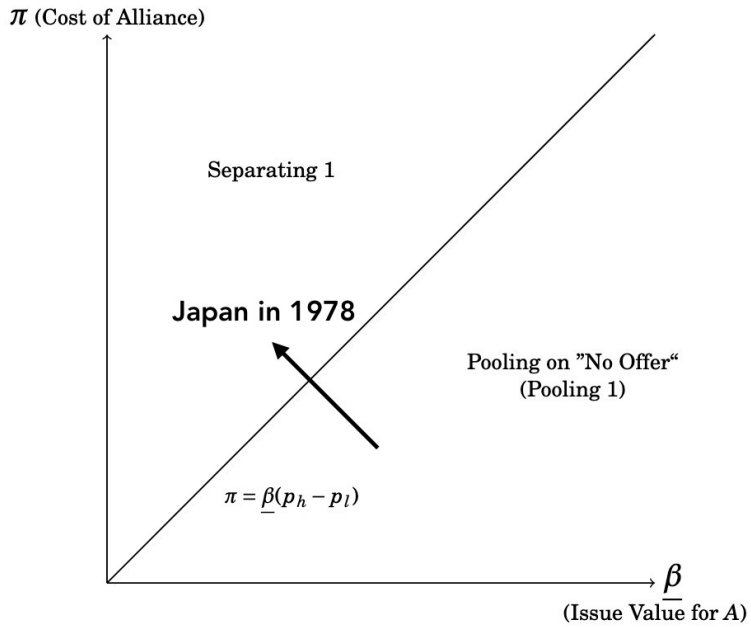
Japan 1978

- Japan did not have to pay any extra costs for the alliance according to the alliance treaty

Japan 1978

- Japan did not have to pay any extra costs for the alliance according to the alliance treaty
- Japan started cost-sharing in 1978 upon the request from Carter

Japan 1978



Japan entered the separating equilibrium in 1978.

- π increases
- β decreases
- The threat of abandonment is credible

Japan 1978

Japan entered the first separating equilibrium in 1978.

- π was increasing

Japan 1978

Japan entered the first separating equilibrium in 1978.

- π was increasing
  $\leftarrow$ Japan's economic growth and inflation

Japan 1978

Japan entered the first separating equilibrium in 1978.

- π was increasing
  $\leftarrow$ Japan's economic growth and inflation
- β was decreasing

Japan 1978

Japan entered the first separating equilibrium in 1978.

- π was increasing
  $\leftarrow$ Japan's economic growth and inflation
- β was decreasing
  $\leftarrow$ The end of the Vietnam War and the approach to CCP

Japan 1978

Japan entered the first separating equilibrium in 1978.

- π was increasing
  $\leftarrow$ Japan's economic growth and inflation
- β was decreasing
  $\leftarrow$ The end of the Vietnam War and the approach to CCP
- The US's threat of abandonment was credible

Japan 1978

Japan entered the first separating equilibrium in 1978.

- π was increasing
  $\leftarrow$ Japan's economic growth and inflation
- β was decreasing
  $\leftarrow$ The end of the Vietnam War and the approach to CCP
- The US's threat of abandonment was credible
  $\leftarrow$ the US's withdrawal from other Asian countries

Conclusion

This paper

- investigates a model of cost-sharing negotiations
- shows (a) credible threat of abandonment is key for successful cost-sharing negotiations
- (b) allies sometimes abandon the signaling aspect to secure a capability boost
- (c) allies sustain deterrence through cost-sharing even when a patron's commitment is limited

Conclusion

This paper

- investigates a model of cost-sharing negotiations
- shows (a) credible threat of abandonment is key for successful cost-sharing negotiations
- (b) allies sometimes abandon the signaling aspect to secure a capability boost
- (c) allies sustain deterrence through cost-sharing even when a patron's commitment is limited

Thank you!

yuji.masumura@utexas.edu

Appendix

Clarification

Burden-sharing: coordination about each member's military capability

Cost-sharing: direct or indirect payment of the cost of alliances or deployment

Appendix 1

Assumption

$$p_l > c_T \tag{1}$$

$$\min\{\overline{\beta}(p_m - p_l), \underline{\beta}(p_h - p_l)\} > c_A > \underline{\beta}(p_m - p_l) \tag{2}$$

Appendix 2

Proposition (Separating 1)

When assumption 1 is satisfied and

$$I < 0 \tag{3}$$

$$\overline{\beta} > \frac{\underline{\beta}(p_h - p_l) - c_A}{p_h - p_m - c_T} \tag{4}$$

$$\frac{p_h - p_m - c_T + c_A}{p_h - p_l} > \underline{\beta} \tag{5}$$

$$p_h - p_m > c_T, \tag{6}$$

$$\underline{\beta}(p_h - p_l) < \pi < \overline{\beta}(p_h - p_m - c_T) + c_A, \tag{7}$$

there exists a separating PBE at which the committed type of A does not make any cost-sharing offer, C offers $x = p_h - c_T$, and T accepts it, and the uncommitted A offers $a = \min\{a^* = p_h - p_l, \overline{a}\}$, T accepts the offer, C offers $x = p_h - c_T$, and T accepts it on the path of play.

Appendix 3

Proposition (Separating 2)

When assumption 1 and Line 4, 5, 6, and 7 are satisfied and

$$\bar{a} > a^* \tag{8}$$

$$\min\{1, l^* = \frac{(1+\underline{\beta})a^* - \pi}{\bar{a} - a^*}\} > l \geq 0 \tag{9}$$

there exists a separating PBE at which the committed type of A offers $a = \bar{a}$, T rejects it, A does not withdraw from the alliance, C offers $x = p_h - c_T$, and T accepts it, and the uncommitted A offers $a = a^*$, T accepts the offer, C offers $x = p_h - c_T$, and T accepts it on the path of play. See Appendix for proof.

Appendix 4

Proposition (Separating 3)

When assumption 1 and Line 4, 5, 6, and 7 are satisfied and

$$\overline{a} > (\underline{\beta} + 2)a^* - \pi \tag{10}$$

$$1 > I > I^* \tag{11}$$

there exists a separating PBE at which the committed type of A offers $a = \overline{a}$, T rejects it, A does not withdraw from the alliance, C offers $x = p_h - c_T$, and T accepts it, and the uncommitted A offers $a = \overline{a}$, T rejects the offer, A withdraw from the alliance, C offers $x = p_h - c_T$, and T accepts it on the path of play. See Appendix for proof.

Appendix 5

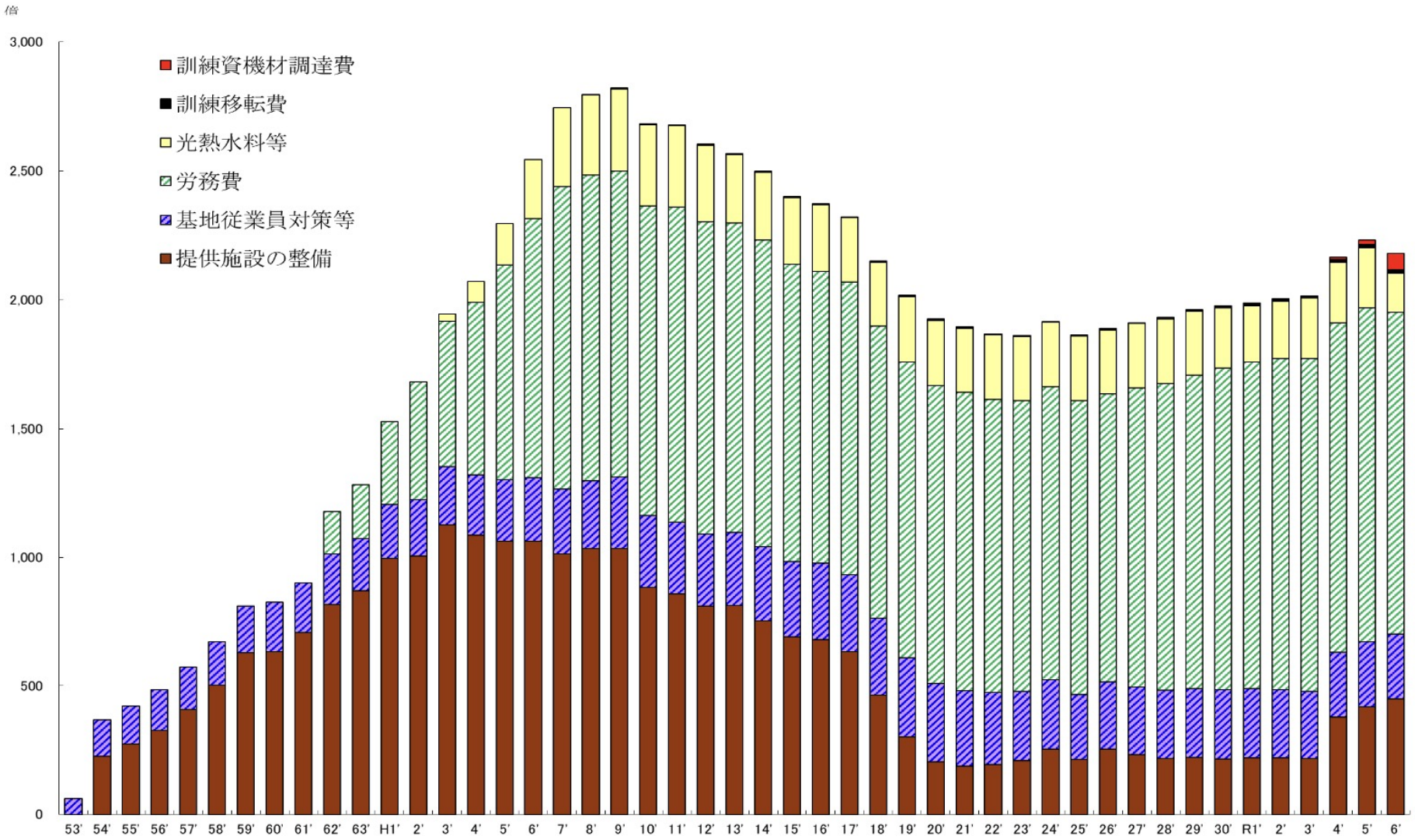
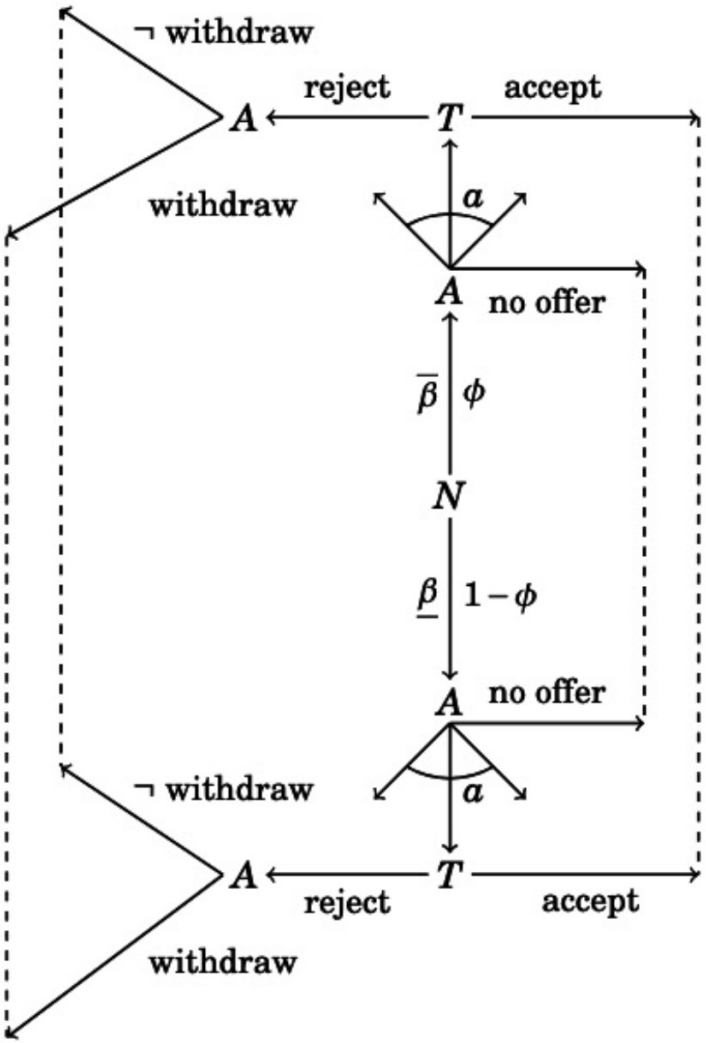


Figure: Japan's Cost-Sharing Over Time

Appendix 6: Payoffs from the Negotiation



Outcomes: no offer, sharing, free-riding, and withdrawal

Payoffs from the negotiation: $\lambda_{i,n}$

$$\lambda_{A,n} = \begin{cases} -\pi & (\text{if } n = \text{no offer}) \\ -\pi + a + la & (\text{if } n = \text{sharing}) \\ -\pi + la & (\text{if } n = \text{free-riding}) \\ 0 + la & (\text{if } n = \text{withdrawal}) \end{cases}$$

$$\lambda_{T,n} = \begin{cases} -a & (\text{if } n = \text{sharing}) \\ 0 & (\text{otherwise}) \end{cases}$$

Appendix 7: Crisis Bargaining

- C offers $x \in (0, 1)$
- T accepts the offer or not
- If T accepts, it gets x and C gets $1 - x$
- If T rejects, war occurs and A decides to intervene or not
- The prob. of winning for T: $p \in (0, 1)$

$$p = \begin{cases} p_l & \text{(fighting alone)} \\ p_m & \text{(fighting together w/o alliance)} \\ p_h & \text{(fighting together w/ alliance)} \end{cases}$$

Appendix 8: Payoffs

$$u_i(\text{Settlement}) = \begin{cases} \beta x + \lambda_{A,n} & (\text{if } i = A) \\ x + \lambda_{T,n} & (\text{if } i = T) \\ 1 - x & (\text{if } i = C) \end{cases}$$

$$u_i(\text{Bilateral War}) = \begin{cases} \beta p_l + \lambda_{A,n} & (\text{if } i = A) \\ p_l - c_T + \lambda_{T,n} & (\text{if } i = T) \\ 1 - p_l - c_C & (\text{if } i = C) \end{cases}$$

$$u_i(\text{Multilateral War w/o Alliance}) = \begin{cases} \beta p_m - c_A + \lambda_{A,n} & (\text{if } i = A) \\ p_m - c_T + \lambda_{T,n} & (\text{if } i = T) \\ 1 - p_m - c_C & (\text{if } i = C) \end{cases}$$

$$u_i(\text{Multilateral War w/ Alliance}) = \begin{cases} \beta p_h - c_A + \lambda_{A,n} & (\text{if } i = A) \\ p_h - c_T + \lambda_{T,n} & (\text{if } i = T) \\ 1 - p_h - c_C & (\text{if } i = C) \end{cases}$$