Commitment Problems

A Social Dilemma

You would take a good action if I would credibly promise to do something in the future

You can't trust me to follow through on my promise

You take a different action as a result of the lack of trust that makes both of us worse off
The ability to commit can create a Pareto improvement

Why is there Conflict?

2 parties are having a dispute

- War
- Law Suit
- Strikes
- Bargaining over an externality

Conflict/Bargaining failure is costly

Bargain exists making both better off

- Propose: expected outcome of conflict

Why is there costly conflict?

The Puzzle

Value of the good: B

Cost of conflict: c

Probability party 1 wins: p

If fight:

$$U_1 = pB - c \qquad U_2 = (1-p)B - c$$

Bargaining can yield the payoffs

$$U_1 = pB \qquad U_2 = (1-p)B$$

Explaining Costly Conflict

Overconfidence

Indivisibility

Commitment Problems

Negotiation and Conflict

Divided Society with two groups:

- Large (L)
- Small (S)

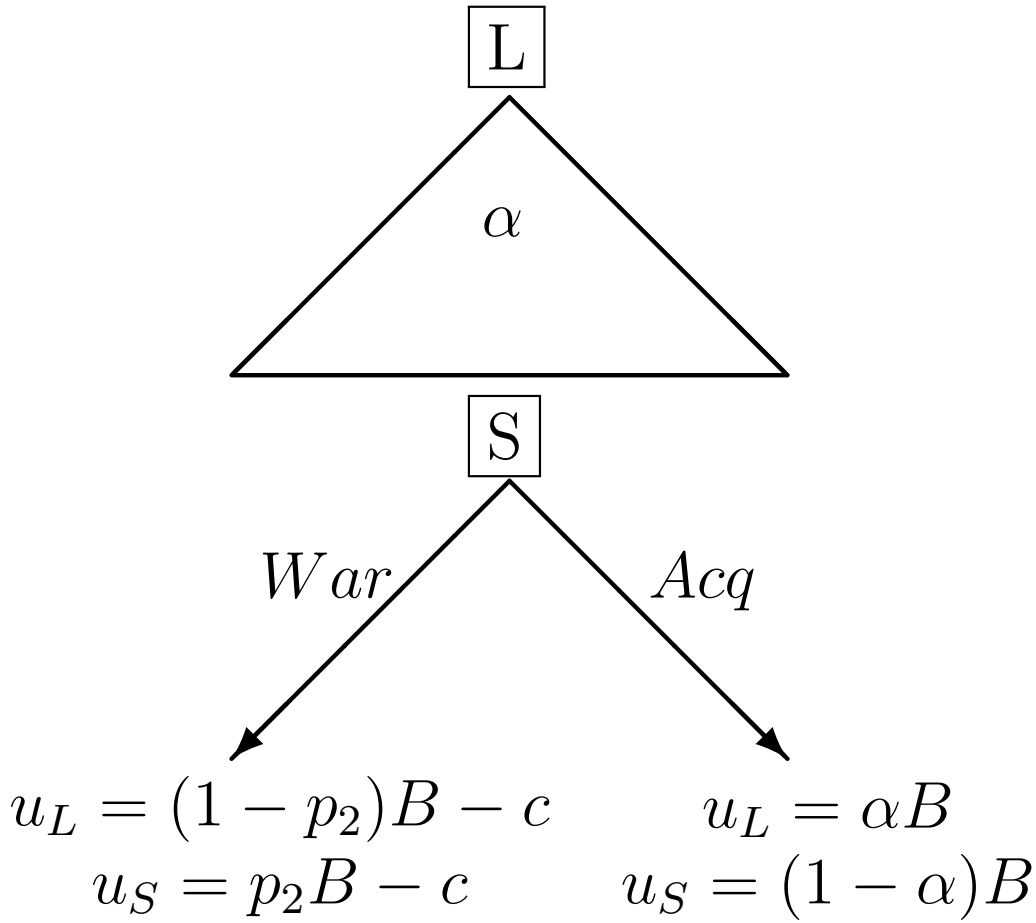
Large divides resources, B

- Keep share α and give $1 - \alpha$ to Small

Small group can accept $1 - \alpha$ or start conflict

- Small group wins conflict with probability p_2

The Extensive Form Game



Small's best-response

No Conflict if:

$$\alpha < 1 - p_2 + \frac{c}{B}$$

Conflict if:

$$\alpha > 1 - p_2 + \frac{c}{B}$$

Indifferent if:

$$\alpha = 1 - p_2 + \frac{c}{B}$$

Large's best response

Suppose Small chooses no conflict when indifferent

Large wants to maximize her share

- Choose largest $\alpha \leq 1 - p_2 + \frac{c}{B}$

Subgame Perfect Nash equilibrium:

- $\alpha^* = 1 - p_2 + \frac{c}{B}$
- Conflict if $\alpha > 1 - p_2 + \frac{c}{B}$; No if $\alpha \leq 1 - p_2 + \frac{c}{B}$

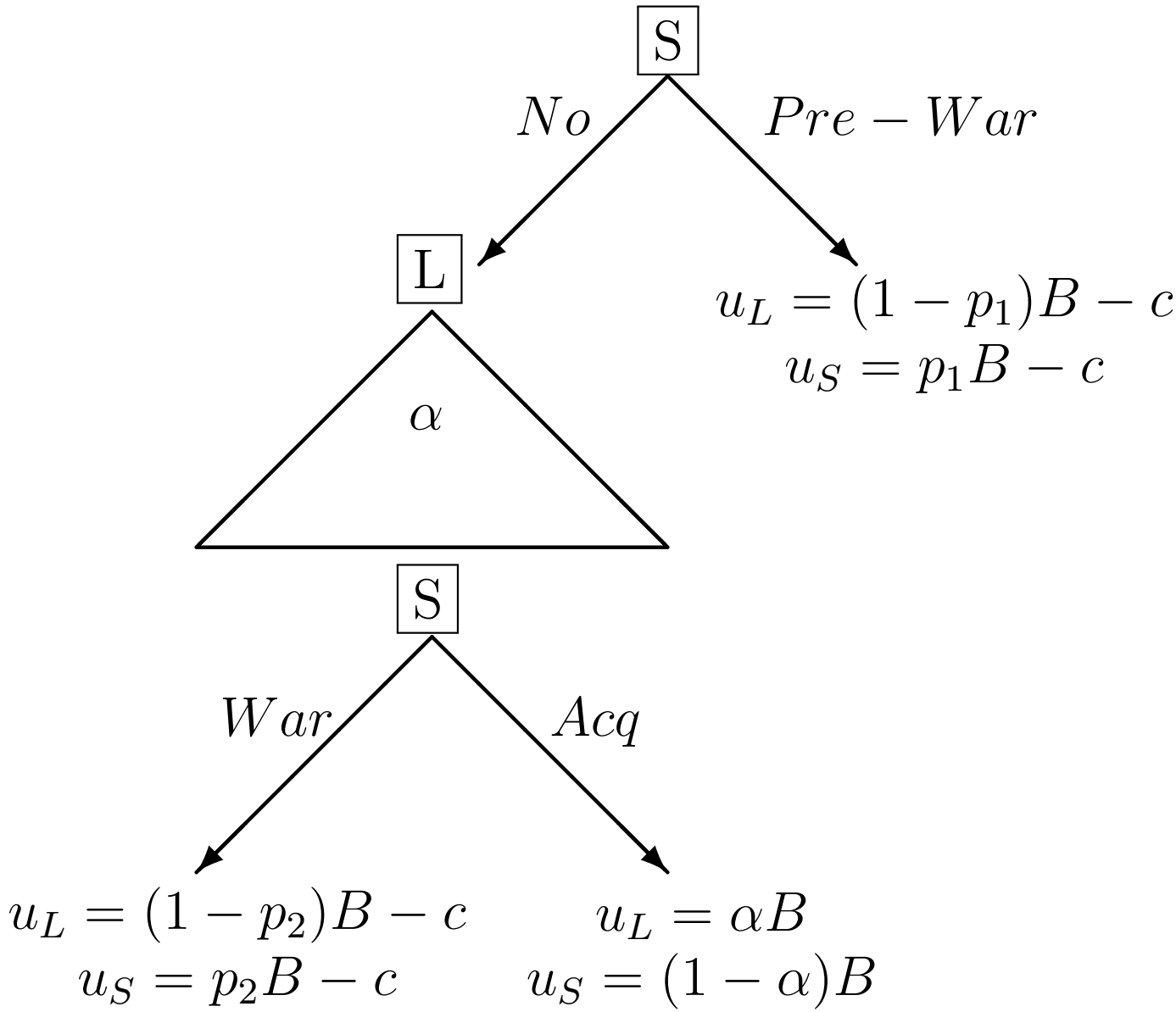
Preemptive Conflict

Same model but with an initial stage in which Small can start preemptive conflict

Small wins preemptive conflict with probability $p_1 > p_2$

Idea is that Large is consolidating power

Preemptive Extensive Form Game



Preemptive Attack

Without preemptive conflict, Small's payoff is $p_2 B - c$

With preemptive conflict, Small gets $p_1 B - c$

Preemptive conflict is a best-response

A Pareto Improvement

Suppose large could commit to proposing $\alpha = 1 - p_1$

Small would accept

$$p_1 B > p_2 B - c$$

Large's Payoff

- Equilibrium: $(1 - p_1)B - c$
- Suggested offer: $(1 - p_1)B$

Small's Payoff

- Equilibrium: $p_1 B - c$
- Suggested offer: $p_1 B$

Commitment Problem

Large cannot commit to $\alpha = 1 - p_1$

Once Small foregoes preemptive attack, Large will renege and propose $\alpha = 1 - p_2 + \frac{c}{B} > 1 - p_1$

Small's payoff is then $p_2 B - c$

Thus, Small launches a preemptive attack

Examples

Elites inside firm or organization blocking technological change

Immigration reform

Labor/Management dispute

Negotiating with terrorists

The Hold-up Problem

Need up-front investment by an upstream producer

After investment has taken place, bargaining power shifts to the downstream producer

Leaders to under-investment of the upstream firm

A Model

Upstream producer produces e units at cost $\frac{c}{2} \cdot e^2$

Downstream producer offers a price p per unit

- Values produce at α per unit

Upstream producer can accept the offered price or use the product by itself

- Values the product at $\beta < \alpha$ per unit

Subgame Perfect Nash equilibrium

Upstream will accept any price, $p \geq \beta$

Downstream will offer $p = \beta$

Upstream effort will solve

$$\max_e \beta e - \frac{c}{2} e^2$$

Optimal choice of effort: $e^* = \frac{\beta}{c}$

Utilitarian Optimum

Utilitarian Planner solves:

$$\max_{e} \alpha e - \frac{c}{2} e^2$$

Planner's choice of effort: $e^* = \frac{\alpha}{c}$

Upstream firm underinvests

Examples of Hold-up Problems

Supplier invests in infrastructure to build product to company's specifications

An inventor selling an invention to user with highest valuation

Users of specialized software

A partnership where one partner invests in technical expertise and the other in client relations

Policy Responses to Commitment Problems

Complete Contracts

Decrease asset specificity

Multiple Suppliers

Vertical Integration

Instill trust

Take Aways

Commitment problems arise in dynamic settings due to shifting circumstances and incomplete contracting

Give rise to inefficient behavior due to anticipation of future circumstances

One solution is to create institutions

Another solution is to add improve the contracting environment