Political Economy
Theory and Experiments
Lecture 7

Francesco Squintani
University of Warwick

email: f.squintani@warwick.ac.uk

International Conflict

. The study of international conflict is a frontier topic in theoretical and empirical political economy.

. We use bargaining and communication games to study conflicts among sovereign entities.

. There are no international law-enforcing institutions, nor market rules, and bargaining is the only means of conflict resolution.

. A first question is why bargaining fails and conflict takes place.

. A fundamental research agenda is the design of mechanisms and institutions that reduce the risk and severity of conflict.

Rationalist explanations for war (Fearon 1995)

. Because conflict is costly, there should always be a negotiation outcome that dominates war (Coase theorem).

. When does this theorem fail?

- . commitment problem leading to preventive/preemptive wars,
- . multilateral interests,
- . agency problem like biased leaders,
- . asymmetric information.

Commitment and preemptive wars

. Commitment problem is exemplified by the Munich agreement.

UK minister concedes territory in Czech Republic to Hitler in exchange of promise not to continue with war, but obviously no enforcement of promise could be possible.

. More generally, any concession to an entity so as to avoid war makes that entity stronger.

. It is hard to commit not to use the greater strength in the future.

. This gives incentives today to others to start preventive attacks.

. If a first strike advantage exists, there are incentives to start preemptive attacks, as the opponent cannot commit not to attack.

Multilateral conflict

. Multilateral interests breed conflict, as shown in the 3 player case.

. Suppose entities A, B, and C seek control of a stake of value 1. They can make alliances and fight, or try to reach an agreement.

. An alliance configuration is a partition P of $\{A, B, C\}$.

. The collective value of each alliance $L \subset \{A, B, C\}$ is $v_L > 0$.

. The collective value of a peaceful agreement is $v_{ABC} = 1$

. When $P \neq \{\{A, B, C\}\}$, there is conflict and $\sum_{L \in P} v_L < 1$.

. For all i, j, z, suppose $v_i = v_j$, $v_{ij} = v_{jz}$ and $v_i + v_j < v_{ij}$.

. For any configuration P, the allocations x are such that for all $L \in P$, $\sum_{i \in L} x_i = v_L$: entities split value of the alliance.

. There is no stable configuration of alliances P and allocations x_A, x_B, x_C. The core of this cooperative game is empty.

. Configurations P with A, B, C all independent are not stable because $v_i + v_j < v_{ij}$ for all i, j: two would form an alliance.

. Configurations P with allied pairs like A and B are not stable because C could offer either A or B a better deal:

- . if $x_A < v_{AC} - v_C$, C could offer A a better deal than B, and if $x_B < v_{BC} - v_C$, B and C would gang up against A;
- . at least one of these inequality must hold, or else $v_{AB} + 2v_C \geq v_{AC} + v_{BC}$ i.e., $v_A + v_C \geq v_{AC}$.

. The grand coalition of A, B and C is not stable: two players would want to jointly break away and gang up against the third.

Political Bias and War (Jackson and Morelli 2007)

. There is complete information about each of two entities' probability of winning war, that depends on relative wealth.

. If a war ensues, each entity incurs a cost, and then the victor claims a portion of the loser's wealth.

. Transfers may be used to avoid conflict, and such treaties are binding (full commitment case).

. The focus is on the difference between the cost/benefit ratio of each entity's pivotal decision maker (from autarch to median voter depending on regime) and the payoffs of the rest of the population.

. We call this difference "political bias".

The model

. An entity of wealth w_i can win a war with entity j with prob. $p0_{ij} = p(w_i, w_j)$.

. Cost of war is fraction C of wealth, the gains for the winner are a fraction G of the loser's wealth.

. a_i is fraction of wealth w_i controlled by the pivotal agent in i;

. a'_i is fraction of gains from winning a war for the pivotal agent.

. Political bias: $B_i = a'_i / a_i$.

. The incentives to fight are based on the pivotal agent's expected gains vs. losses:

$$B_j p_{ji} G w_i > (<) C w_j + (1 - p_{ji}) G w_j.$$

Proposition Consider any fixed w_i, p_{ij} and rule out transfers.
If $B_i = B_j = 1$, then at most one entity wishes to fight.
Fixing C/G, both entities fight for sufficiently high B_i, B_j.
Fixing B_i, B_j, neither entity goes to war for high C/G.

- Transfers avoid a war if
  - in the absence of transfers j wants to attack i,
  - i prefers to pay some t_{ij} over going to war;
  - j would prefer to have peace $+t_{ij}$ over war, and can commit not to fight after receiving the transfer.

Proposition Two unbiased entities never fight if they can make transfers and the receiver can commit not to fight.

Proposition Suppose that in the absence of transfers j would want to fight but i would not. The range of C/G such that war can be avoided through a transfer is larger when B_i is smaller, p_{ji} is larger, w_i/w_j is larger. The effect of B_j is ambiguous.

. A collection of entities is 'bilaterally stable' if no two entities want to fight even in the absence of transfers.

Proposition With winning probabilities proportional to wealth, a collection of unbiased entities is bilaterally stable.

Proposition If all entities have equal wealth and the winning probabilities p_{ij} are symmetric, then the configuration is bilaterally stable if and only if $B_j \leq 1 + 2C/G$.

Hobbesian Traps (Baliga and Sjostrom 2012)

. Thucydides to Hobbes: wars are due to greed, fear and honor.

. Opponents' preferences are private information.

. Fear that opponents might be greedy leads to war.

. This is modelled as a global game, a stag-hunt game with asymmetric information about players' intentions.

. Militarization and conflict is the risk-dominant equilibrium, selected in the global game in a 'spiral of greed and fear'.

. Players can use cheap-talk to undo spirals of greed and fear.

. But a third-party provocateur can trigger war with cheap-talk.

The conflict game

. A and B simultaneously choose whether to act hawkish or dovish. This is interpreted either as the choice between attacking or not, or as the choice between arming or not.

. The payoff matrix is:

	H	D
H	$-c_i$	$g - c_i$
D	$-d$	0

. For each player i, the cost of conflict is c_i.

. $g > 0$ is the greed factor and $d > 0$ is the fear factor, $g < d$.

. Player i is a coordination type if $g < c_i < d$, a dominant strategy hawk if $c_i < g$, and a dominant strategy dove if $c_i > d$.

. The game is called stag-hunt if payoffs are common knowledge and both players are coordination types.

. The stag-hunt game has two Nash equilibria: (H, H) and (D, D), (D, D) is Pareto dominant and (H, H) is risk dominant.

. Hobbes believes that the likely equilibrium is (H, H).

. There may be types who actually desire conflict, and this causes everyone to be aggressive for self-defence in fear of aggression.

. c_A and c_B are independent and uniformly distributed on $[0, 1]$.

. Player i knows his own c_i, and his strategy is a cutoff strategy $\hat{c}_i$, implying that he chooses D if $c_i \geq \hat{c}_i$ and H otherwise.

. Assume $0 < g < 1$: there are hawk and coordination types.

Proposition The conflict game with payoff uncertainty has a unique equilibrium. If $d > 1$ (dominant strategy doves are ruled out), then each player chooses H with probability one.

Proof: Consider a coordination type $c_i = g + \varepsilon$, s.t. $\varepsilon > 0$ small.

. Type c_i expected payoffs for playing D and H are:

$Eu_i(D; c_i) = g(-d)$, $Eu_i(H; c_i) = g(-c_i) + (1-g)(g - c_i)$.

. For ε small, $(1-g)g - c_i + gd > 0$ and type c_i plays H.

The $c_i = g + \varepsilon$ coordination type plays H driven by fear.

. Because c_i plays H, also type $c_i' = c_i + \varepsilon$ makes the same calculation and plays H, for $\varepsilon > 0$ small.

. Iterating the argument, all coordination types play H.

. A few greedy types lead to a "spiral of fear."

- If there are dominant-strategy doves, conflict is not as pervasive.
- If $d < 1$, equilibrium is characterized by an interior threshold $\hat{c}$.
- To solve for $\hat{c}$, suppose j uses threshold $\hat{c}_j$.
- A coordination type c_i expected payoffs for playing D and H are: $Eu_i(D; c_i) = \hat{c}_j(-d)$ and $Eu_i(H; c_i) = (1 - \hat{c}_j)g - c_i$.
- Player i is indifferent between D and H if:

  $$c_i = \varphi(\hat{c}_j) \equiv g + \hat{c}_j(d - g).$$
- Hence, $\hat{c} = \varphi(\hat{c}) = g + (d - g)\hat{c}$, or $\hat{c} = \frac{g}{1-d+g}$.
- Note that φ is upward sloping (strategic complementarity). Hence, the threshold $\hat{c}$ is increasing in d.

Information transmission

- Suppose $d > 1$, without communication everybody plays H.
- Let players send a simultaneous message (h or p) before play.

Proposition There exist thresholds $\hat{c}^L, \hat{c}^H$, with $g < \hat{c}^L < \hat{c}^H < 1$, such that "predators" types $c_i < \hat{c}^L$ and "peaceable" types $c_i > \hat{c}^H$ send p; "honorable" types $c_i \in [\hat{c}^L, \hat{c}^H]$ send h.
Peaceable types play D after messages (p, p) and H after (p, h).
Honorable types play D after (h, h) and H after (h, p).
Predators always play H.

- Peaceable types declare they will not fight unless they see h.
- Predators pretend to be peaceable and then fight.
- Honorable types act tough to coordinate play on (D, D).

Proof: Equilibrium payoff of a honorable type $c_i \in (\hat{c}^L, \hat{c}^H)$ is:

$$Eu_i^C(c_i) = -c_i(1 - \hat{c}^H) - c_i\hat{c}^L.$$

. Equilibrium payoff of a predator type $c_i \in (g, \hat{c}^L)$ is:

$$Eu_i^R(c_i) = (g - c_i)(1 - \hat{c}^H) - c_i\hat{c}^H.$$

. $Eu_i^C(c_i) - Eu_i^R(c_i) = c_i(\hat{c}^H - \hat{c}^L) - g(1 - \hat{c}^H) \uparrow c_i.$

. Marginal type $\hat{c}^L$ is indifferent: $Eu_i^C(\hat{c}^L) = Eu_i^R(\hat{c}^L)$,
$Eu_i^C(c_i) > (<) Eu_i^R(c_i)$ for every type $c_i > (<) \hat{c}^L$.

. Equilibrium payoff of a peaceable type $c_i \in (\hat{c}^H, 1)$ is:

$$Eu_i^P(c_i) = -c_i(\hat{c}^H - \hat{c}^L) - d\hat{c}^L.$$

. $Eu_i^C(c_i) - Eu_i^P(c_i) \downarrow c_i$. $\hat{c}^H$ is indifferent: $Eu_i^C(\hat{c}^H) = Eu_i^P(\hat{c}^H)$,
$Eu_i^C(c_i) > (<) Eu_i^P(c_i)$ for every type $c_i < (>) \hat{c}^H$.

. Equilibrium $\hat{c}^L, \hat{c}^H$ pinned down by the indifference conditions:

$$Eu_i^C(\hat{c}^L) = Eu_i^R(\hat{c}^L) \text{ and } Eu_i^C(\hat{c}^H) = Eu_i^P(\hat{c}^H).$$

Provocation

. Cheap talk communication by third parties can provoke conflict.

. Before A and B choose H or D, an extremist E in entity A can send a cheap talk message $\hat{m}_E \in \{\ell, h\}$.

. The extremist E has a "negative" cost for war $c_E < 0$.
E wants A to choose H, regardless of c_A.

. For $i = A, B$, assume $d < 1$, all three types are possible.

. Cost c_E is public, both A and E know c_A, B only knows c_B.

. Everybody knows that E is a provocateur.

. But provocation acts a equilibrium coordination device.

. The possibility of provocation increases overall probability of war.

. Equilibrium of game without E is characterized by threshold $\hat{c}$: coordination types with $c_i < \hat{c}$ play H, those with $c_i > \hat{c}$ play D.

. There is a "babbling" equilibrium where provocation is ignored.

. In bad equilibrium, E sends $\hat{m}_E = h$ iff $c_A \in (\hat{c}_A(\ell), \varphi(d)]$.

. After $\hat{m}_E{=}h$, players use thresholds $\hat{c}_B(h) = d$, $\hat{c}_A(h) = \varphi(d)$.

. Because $\hat{c}_B(h) = d$, A plays H iff $-c_A + (1 - d)g \geq d(-d)$, i.e., $c_A \leq \varphi(d)$. The threshold $\hat{c}_A(h) = \varphi(d)$ is best response.

. Because $\hat{c}_A(h) = \varphi(d)$, player B plays H iff $-c_A \geq -d$. The threshold $\hat{c}_B(h) = d$ is a best response.

. After message $\hat{m}_E = \ell$, player B uses threshold $\hat{c}_B(\ell) < d$.

. As B plays H with prob. $< F(d)$, A's best response must be s.t.

$$\hat{c}_A(\ell) = \varphi(\hat{c}_B(\ell)) < \varphi(\hat{c}_B(h)) = \varphi(d) = \hat{c}_A(h).$$

. Both players' thresholds are higher after $\hat{m}_E = h$ than $\hat{m}_E = \ell$: the spiral of greed and fear is more severe after provocation.

. When $c_A \in (\hat{c}_A(\ell), \varphi(d)]$, provocation makes player A switch from D to H. This is what player E wants.

. But provocation also makes player B more likely to play H, and player E would like B to act dovish.

. If $c_A \leq \hat{c}_A(\ell)$ then player A's dominant strategy is H.
If $c_A > \varphi(d)$ then player A's dominant strategy is L.

. In both cases, E sends $\hat{m} = \ell$ to minimize probability B plays H. Provocation would inflame player B without affecting A's choice.

. Relative to the case without E, the probability of war is higher even when E does not provoke (i.e., $\hat{m}_E = \ell$).

. B knows that when $\hat{m}_E = \ell$, A is likely hawkish and plays H.

Summary

. We have considered international relations and conflict.

. Because conflict is costly, there should always be a negotiation outcome that dominates war (Coase theorem).

. Political scientists identified possible sources of conflict:

  . commitment problem leading to preventive/preemptive wars,

  . multilateral interests,

  . agency problem caused by biased leaders.

. I have presented a model that describes conflict as a "Hobbesian trap" caused by private information.

. I have shown that communication may reduce risk of conflict.

Next Lecture

. I focus on conflict caused by asymmetric information.

. Mechanisms that reduce asymmetric information and build trust among disputants reduce the risk of war.

. Bargaining through diplomatic channels may not be effective.

. Peace talks act as a coordination device on possible aggreements, and improve the chance of peace.

. Mediation further improves chances of peace when asymmetric information is of interdependent value.

. Arbitration need not improve over mediation.

. Peace cannot be achieved with probability one.