The Economics of Conflict and Peace

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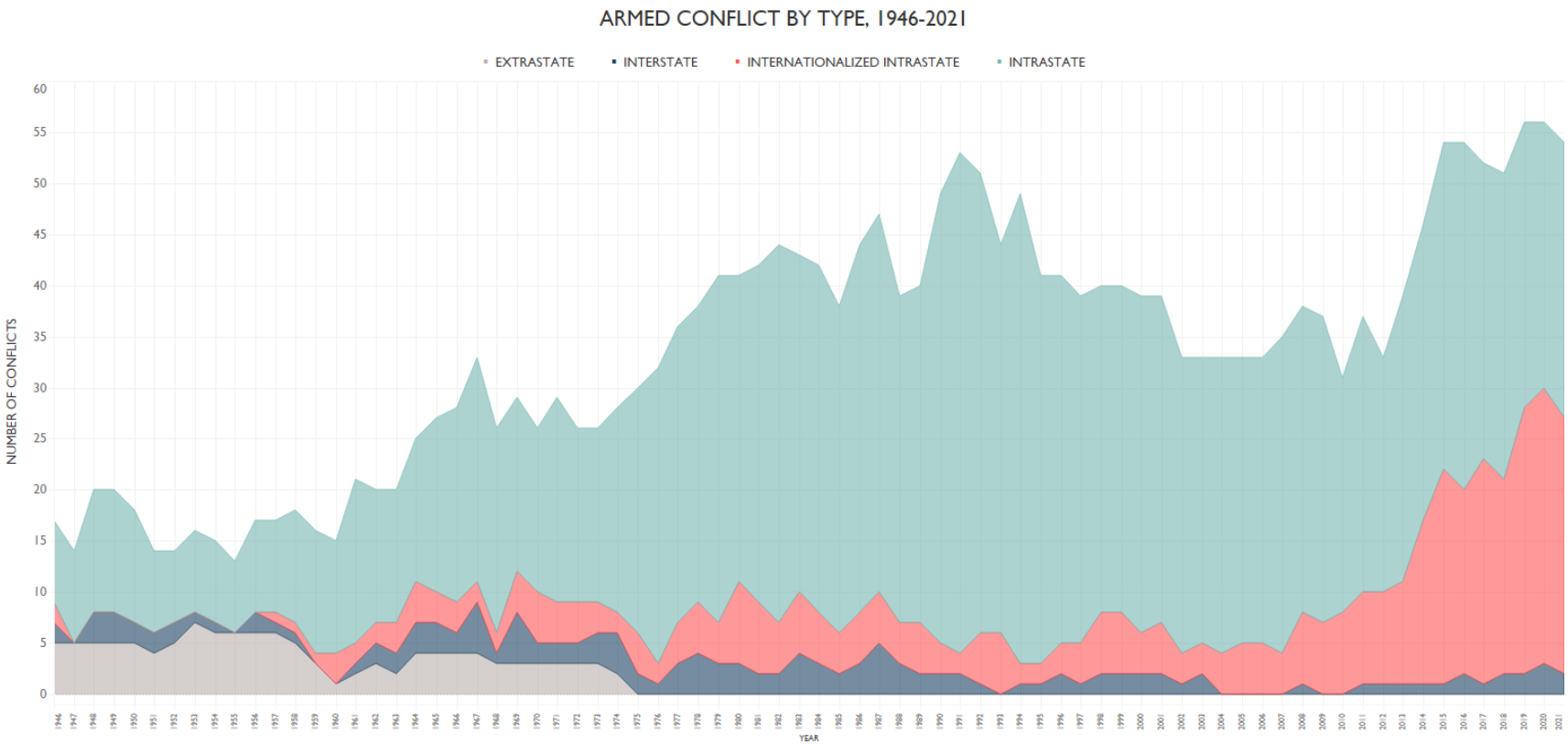
Introduction

Why should economists care about conflict? (I)



Based on UCDP 22.1 data

Introduction

Why should economists care about conflict? (II)

- To state upfront that the main focus today will lie on *civil* conflict.
- *Direct loss of human life*: Narrowly defined battle-related deaths from 1946 to 2019 amount to about 11 million fatalities (Lacina and Gleditsch, 2005; updated with current numbers from the UCDP, 2021). One has to add to these numbers the human lives lost in one-sided conflict, where armed troops turn their weapons against defenseless civilians. Anderton and Brauer (2021) estimate 100 million mass atrocity-related deaths since 1900.
- *Indirect effect of wars on human life*: Works through diseases after the end of conflicts. Ghobarah, Huth and Russett (2003, APSR) find that the indirect fatalities are at least as large as direct casualties.

Introduction

Why should economists care about conflict? (III)

- *Large economic costs*. According to Mueller and Tobias (2016), an average drop in GDP of 18 percent after a civil war, and only a very slow economic recovery.
  - Abundant micro-evidence: E.g. Abadie and Gardeazabal (2003, AER) find that terrorism from 1955 to 1995 in the Basque country led to a 10% GDP gap with respect to synthetic control group.
- Also large-scale destruction of *human capital* (Shemyakina, 2011, JDE) and of *(inter-group) social capital* (Rohner, Thoenig and Zilibotti, 2013, JOEG; Bauer et al., 2016, JEP)

Introduction

Why should economists care about conflict? (IV)

- *Various war traps:* Rohner and Thoenig, 2021, "The Elusive Peace Dividend of Development Policy: From War Traps to Macro Complementarities", *Annual Review of Economics*
- 68 percent of all civil conflict outbreaks in the second half of the 20th century took place in countries experiencing multiple wars.
- Several types of war traps that hold countries persistently back, both economically and politically.
  - Trust
  - Poverty
  - Education

Empirical evidence on poverty, nat. resour., ethnic polariz.

Overview

- Rent-seeking models of conflict yield the prediction that more appropriation takes place when the prize is larger and when the opportunity costs of fighting are small.
- Empirically this implies that we except more conflict to occur in the presence of ...
  - poverty / adverse income shocks (lowering opportunity costs of fighting)
  - natural resource abundance (higher prize)
  - greater ethnic polarization (higher prize)
- Similar comparative statics in bargaining failure setting: Higher prize may fuel political bias, higher wages may boost conflict costs and enlarge bargaining space.

Empirical evidence on poverty, nat. resour., ethnic polariz.

Poverty and adverse income shocks (I)

- Mechanism: Rebellion and appropriation require time. In poor and unproductive countries (with low w) the opportunity cost of conflict is therefore smaller, and hence cheaper to hire rebel army.
- Low GDP per capita is a powerful predictor of civil conflict (Fearon and Laitin, 2003, APSR; Collier and Hoeffler, 2004, OEP).
- But hard to disentangle the effect of poverty, as GDP per capita is endogenous, and there may be omitted variables.

Empirical evidence on poverty, nat. resour., ethnic polariz.

Poverty and adverse income shocks (II)

- To establish *causality*, Miguel, Satyanath and Sergenti (2004, JPE) use rainfall variation as instrument for economic growth and still find a strong conflict-reducing effect.

- Dozens of follow-up papers finding that adverse income shocks (i.e. heat, drought) fuel conflict. See e.g. producers (see e.g. Hidalgo et al., 2010, ReStat; Fetzer, 2020, and survey/meta-analyis of Dell et al., 2014, JEL; Burke et al., 2015, ARE).

Empirical evidence on poverty, nat. resour., ethnic polariz.

Natural resources (I)

- Mechanism: Natural resource rents increase the "pie" (R) to be appropriated.

- Particularly "dangerous" resources are:
  - Oil (Fearon and Laitin, 2003, APSR; Ross, 2006, ARPS; Fearon, 2005, JCR; Humphreys, 2005, JCR; Dube and Vargas, 2013, ReStud).
  - Diamonds (Lujala, Gleditsch and Gilmore, 2005, JCR; Humphreys, 2005, JCR; Ross, 2006, ARPS; Olsson, 2007, JDE; Lujala, 2010, JPR).
  - Minerals (Berman, Couttenier, Rohner, Thoenig, 2017, AER)
  - Narcotics (Angrist and Kugler, 2008, ReStat; Lujala, 2009, JCR).

Empirical evidence on poverty, nat. resour., ethnic polariz.

Natural resources (II)

- Identification strategies typically rely on ...
  - ... exploiting trade and commodity price shocks (see Ross, 2006, ARPS; Dube and Vargas, 2013, ReStud; Brückner and Ciccone, 2010, EJ; Besley and Persson, 2011, QJE; Bazzi and Blattman, 2013, AEJ: Macro; Berman, Couttenier, Rohner, Thoenig, 2017, AER; McGuirk and Burke, 2020, JPE).
  - ... using oil discovery shocks in a panel with country FE (see Cotet and Tsui, 2013, AEJ: Macro; Lei and Michaels, 2014, JDE).

- Further results:
  - Lootable resources like alluvial gemstones, narcotics and timber also tend to sustain and prolong war effort during conflict (Fearon, 2004, JPR; Ross, 2004, JPR, 2006; Lujala, 2010, JPR).
  - Oil asymmetry and war (Morelli and Rohner, 2015, JDE; Caselli, Morelli and Rohner, 2015, QJE).

Empirical evidence on poverty, nat. resour., ethnic polariz.

Ethnic polarization (I)

- Microfoundation of polarization measure: Joan Esteban and Debraj Ray, 1999, "Conflict and Distribution", *Journal of Economic Theory*.

$$Polarization = 1 - \sum_{i=1}^{N} \left(\frac{1/2 - \pi_i}{1/2} \right)^2 \pi_i$$

where π_i is the proportion of people who belong to the ethnic (religious) group i, and N is the number of groups.

  - Polarization is largest when there are only two groups of similar size (versus Fractionalization, which increases in the number of groups).

Empirical evidence on poverty, nat. resour., ethnic polariz.

Ethnic polarization (II) (from Montalvo and Reynal-Querol, 2005, AER)

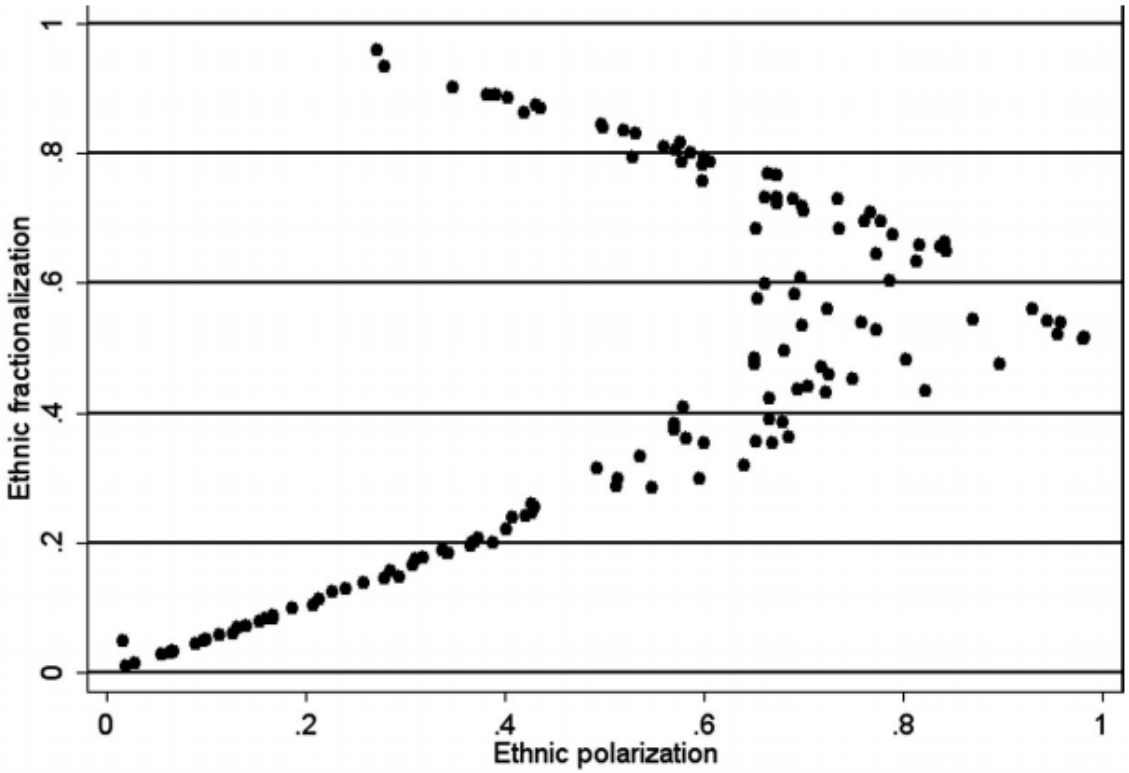


FIGURE 1. ETHNIC FRACTIONALIZATION VERSUS POLARIZATION

Source: WCE.

Empirical evidence on poverty, nat. resour., ethnic polariz.

Ethnic polarization (III)

- Ethnic polarization associated with
  - civil war (see e.g. Reynal-Querol, 2002, JCR; Montalvo and Reynal-Querol, 2005, AER; Esteban, Mayoral, Ray, 2012, AER).
  - mass killings (see Esteban, Morelli, Rohner, 2015, JPE).

- Causal link? Difficult to establish, as persistence in polarization levels (i.e hard to include country/region FEs -> hard to control for unobserved factors)

- Recent contribution by Chiovelli and Amodio (2018, Journal of the European Economic Association) finds that increases in ethnic polarization fuel conflict.

Peace Policies: Securities, Wages, Democ., Building Trust

Overview and Securities

- The troubles with aforementioned factors is that they are not very policy relevant.

- New literature on what policies can foster peace, surveyed in Rohner, Dominic, "Mediation, Military and Money: The Promises and Pitfalls of Outside Interventions to End Armed Conflicts", *Journal of Economic Literature*, forthcoming. Also book project.
  - *Mediation*: Good theoretical reasons to think it helps (i.e. information spread, extend bargaining space) yet virtually no causal evidence.
  - *Military*: Military aid often backfires (Dube and Naidu, 2015, JOP; Dimant, Krieger and Meierrieks, 2020, working paper), yet UN peacekeeping shown to reduce violence (see various articles of Lisa Hultman and co-authors)
  - *Money*: Next slides focus on policies that foster economic productivity.

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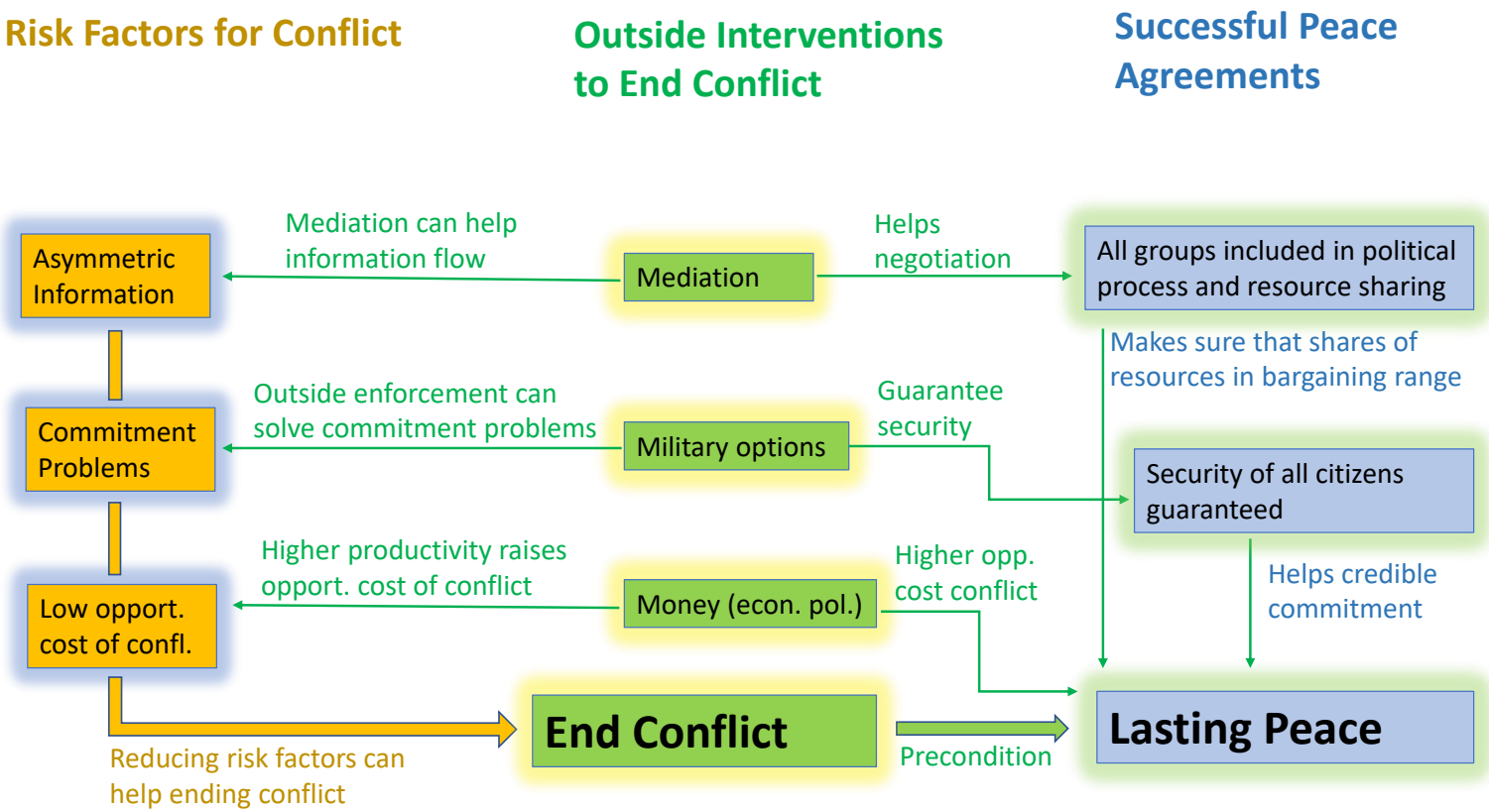
Overview



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Boosting wages

Increasing productivity (higher w) raises the opportunity costs of conflict

- Education policies (Saia and Rohner, 2022, "Education and Conflict", working paper – on school construction program in Indonesia)
- Health policies (Berlanda et al., 2022, "Medication against Conflict", working paper – on anti-retroviral treatment against AIDS in Africa)
- Labor market policies (Blattman and Annan, 2016, APSR – on employment program in Liberia; Fetzer, 2020, JEEA – on workfare program in India)

Better to invest in productivity (increases w) than to disburse cash that can be appropriated (increase R)! (see e.g. Nunn and Qian, 2014, AER, on US food aid and civil conflict)

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Democracy (I)

- Mechanisms:
  - Checks and balances reduce the "stakes" of conflict R in rent-seeking models.
  - Democracy is also a commitment device (Acemoglu and Robinson, 2001, AER) and ...
  - ... reduces asymmetric information (Laurent-Lucchetti, Rohner and Thoenig, 2022) in bargaining settings.
  - Democratic representation could reduce "grievances" (Gurr, 1971, *Why men rebel*, Princeton University Press), but at the same time ...
  - ... it is easier to mobilize groups in a democracy (principles of free speech and right of assembly).
- Hence, net effect is likely to be ambiguous.

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Democracy (II)

- Examples of violence related to elections: Côte d'Ivoire 2010, Kenya 2007, Nigeria 2007 (cf. Collier and Vincente, 2013, EJ) etc.
- Unsurprisingly, most empirical studies find that the relationship between democracy scores and the risk of civil conflict is non-monotonic.
- There is evidence for an "inverted U-shape", i.e. "anocracies" with intermediate democracy scores fare worst (see, for example, Hegre *et al.*, 2001, APSR; Reynal-Querol, 2002, JCR; and Fearon and Laitin, 2003, APSR). $\Rightarrow$ In most full democracies people feel represented and in full autocracies people may have no chance against the regime.

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Democracy (III)

- In poor countries democracy increases the conflict risk, while decreasing it in rich countries (Collier and Rohner, 2008, JEEA).
  - Accountability effect versus regression-in-repression effect.
  - Richer countries have larger states $\Rightarrow$ accountability becomes more important.
  - Poor countries are more dependent on natural resources $\Rightarrow$ hence often rebellion is more about grabbing rents than accountability $\Rightarrow$ accountability effect is smaller.

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Democracy (IV)

- Specific democratic institutions and features that lower the stakes of controlling the government can reduce the risk of conflict.
- *Proportional representation* decreases the risk of civil conflict (Reynal-Querol, 2002, JCR) $\Rightarrow$ Even if a group loses the election, it is still represented.
- *Political inclusion for minority groups* in government and administration reduces conflict risk (Cederman and Girardin, 2007, APSR; Cederman et al., 2010, WP) $\Rightarrow$ Minorities included in the government coalition can peacefully represent their interests.
  - Example: Power-sharing in Northern Ireland (Mueller and Rohner, 2018, EP).

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Democracy (V)

- *Federalism / Territorial autonomy* decreases the risk of rebellion (Saideman et al, 2002, CPS; Cederman et al., 2015, APSR) $\Rightarrow$ More regional autonomy makes it less crucial to control the central government.

- *Rule of Law* (in particular, executive constraints, contract protection, freedom from expropriation and reliable bureaucracy) reduce the conflict risk (Easterly, 2001, EDCC; Besley and Persson, 2011, QJE) $\Rightarrow$ Protects minorities who can defend their interests by peaceful means.

- *Enfranchisement* Representation reduces riots and political violence (Saia and Rohner, 2022, "Ballot or Bullet", working paper – on the impact of the UK's Second Reform Act of 1867)

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Interdependence and Trust - Overview

- In political science there has been a literature on the so-called "security dilemma" or "spiralling model of war" where mutual distrust drives arms races and conflict
  - Herz (1950, World Politics), Jervis (1978, World Politics), Posen (1993, Survival), Snyder (1984, World Politics).

- This has been formalised with the help of global games by Baliga, Sandeep, and Tomas Sjostrom, 2004, "Arms Races and Negotiations", *Review of Economic Studies* 71: 351-369.

- A more recent literature links trust to war, using dynamic models of belief updating (see Rohner et al., 2013, ReStud).

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Interdependence and Trust - War Signals (I)

- Rohner, Dominic, Mathias Thoenig and Fabrizio Zilibotti (2013) "War Signals: A Theory of Trade, Trust and Conflict," *Review of Economic Studies* 80: 1114-1147.

- Builds a rational choice theory of trust, trade and war where a vicious circle is at the root of recurrent conflicts
  - War today erodes inter-ethnic trust
  - Distrust reduces trade opportunities and the opportunity cost of future war falls
  - This leads to recurrent war

- Distrust may be "unwarranted"...without being irrational

- Culprit: imperfect information / learning trap (related to information cascades)

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Interdependence and Trust - War Signals (II)

- Bad luck (a series of bad draws) may result in a permanent war trap (which is an absorbing state)
- A rational theory of persistent (inefficient) wars
- Business relations are key to preserve stable peace
- Peace-keeping forces may secure peace but fail to restore trade and economic cooperation (consistent with evidence, see e.g. Bosnia-Herzegovina)

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Interdependence and Trust - Promote trade? Fostering trust?

- Martin et al. (2008, ReStud) find ambiguous effects (multilateral vs. bilateral).
- Gallea and Rohner (2021, PNAS) find that globalization reduces conflicts in areas of high strategic importance.
- Changing social norms (persuasion campaigns? Chong, Duryea, and La Ferrara (2012, AEJ: Applied) on soap operas and fertility in Brazil)
- Reconciliation ceremonies (Cilliers et al., 2016, Science – RCT in Sierra Leone) and fostering contacts (Mousa, 2020, Science – RCT in Iraq)

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Other policies: Do sanctions work?

- *General economic and trade sanctions* tend to reduce civil war duration, but can substantially hurt the civilian population (e.g., Hufbauer, Schott, and Elliott, 1990, *Economic Sanctions Reconsidered*, Institute for International Economics; Dashti-Gibson, Davis and Radcliff, 1997, AJPS; Bundervoet and Verwimp, 2005, mimeo, for Burundi; Escribà-Folch, 2010, JPR).

- *Targeted arms trade embargoes* during civil wars could be a less costly alternative, but are hard to enforce (Tierney, 2005, RIS; Brzoska, 2008, PEPS; Moore, 2010, JCR; Kopel, Gallant, and Eisen, 2010, PSLR).

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Other policies: Role for International Criminal Court?

- *International Criminal Court*: Double-edged knife.
- On the one hand may be harder to convince dictators with a bad track record to step down if they face prosecution (Snyder and Vinjamuri, 2003, IS).
- But on the other hand the ICC can give powerful incentives to new leaders to not become "criminal dictators" (Akhavan, 2001, AJIL).

Conclusion

Key take-home policy messages (I)

- Green energy transition is key – not only to save the planet but also to reduce the scope for war (remember, oil and minerals key determinants of conflict)
- Promote democracy worldwide – having more democracies reduces the risks of civil and international wars alike
- Better to invest in human capital accumulation (through education and health policies) than lump sum cash / goods distribution (human capital not appropriable like physical capital)

Conclusion

Key take-home policy messages (II)

- Mediation may work, but key to build democratic institutions and to have UN peacekeepers guaranteeing security during transition
- Trade often a force of good, with the exception of trade in fossil fuels and minerals with non-democratic regimes
- Role for building trust and fostering reconciliation

Thank You!

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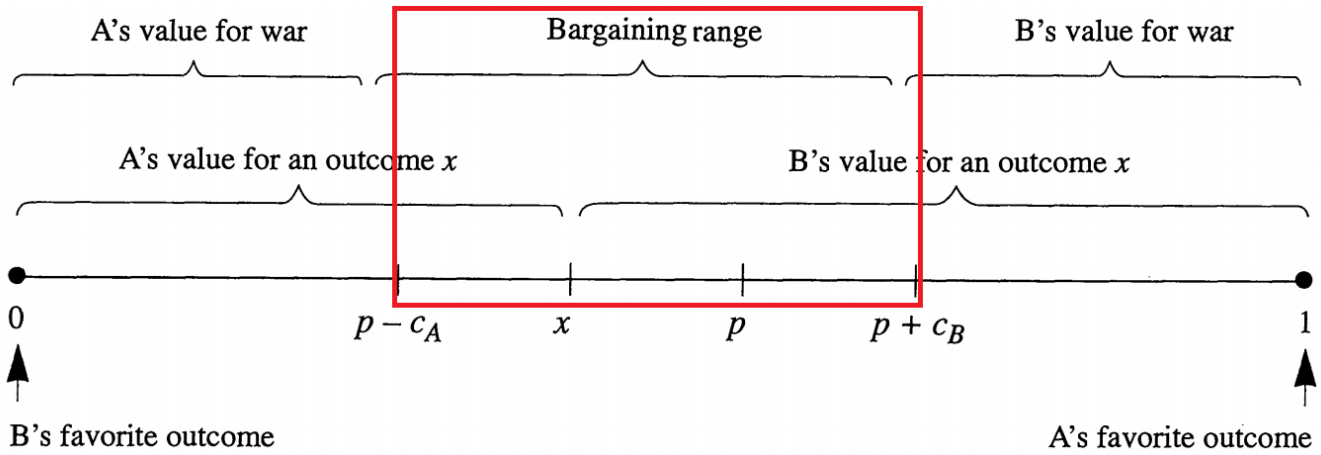
Theory: War as Bargaining Failure

Overview

- Goal of this approach is to explain why conflict takes place
- Conflict is costly and one would expect bargaining over contentious issues being able to avoid war. This literature focuses on reasons for bargaining failure.
- Below is summarized graphically the extremely simple workhorse model of Fearon (1995, IO).

Theory: War as Bargaining Failure

Graphically



- Both states will strictly prefer any peaceful agreement in the interval (p-c_a,p+c_b) to fighting

Theory: War as Bargaining Failure

Main reasons for bargaining failure 1/3

The assumptions of the toy model can be relaxed in the following way:

- PRIVATE INFORMATION: A and B have different estimates of p. They cannot transmit their private information, as such messages may not be credible (given that p affects their bargaining power). Or transmitting proofs of military strength may reduce winning chances (secrecy is useful in fighting).

- RISK-LOVING PLAYERS: This could explain why they prefer a costly lottery to a settlement with certainty.

Theory: War as Bargaining Failure

Main reasons for bargaining failure 2/3

- COMMITMENT PROBLEMS: incentives to renege on peace deals include:
  - Preemptive war and offensive advantages (FIRST STRIKE ADVANTAGE): $p_f > p > p_s$, p_f=winning probability first striker, p_s=winning probability second striker. Lack of credible commitment not to make surprise attack.
  - PREVENTIVE WAR: Say A's winning probabilities increase over time in a dynamic setting (i.e. $p_2 > p_1$) and A cannot credibly commit to not exploiting this advantage later.
  - STRATEGIC TERRITORY: Objects over which states bargain can themselves be sources of military power and there may be lack of credible commitment not to exploit this later.

Theory: War as Bargaining Failure

Main reasons for bargaining failure 3/3

- ISSUE INDIVISIBILITIES: If not all outcomes x are technically feasible due to indivisibilities, bargaining can fail.
  - Examples: Oil fields and natural resources.

- POLITICAL BIAS: Conflict leads to net costs $c_A > 0$, $c_B > 0$, but leaders get more of the gains and bear less of the costs (Jackson and Morelli, 2007, AER)
  - Large statistical literature on "Democratic Peace", e.g. Maoz and Russett, 1993, APSR.
  - In the U.S. during the four conscription-era wars of the 20th century, having a draft-age son reduces a legislator's support for pro-conscription bills by 10-17 percent relative to having a draft-age daughter (McGuirk, Hilger and Miller, 2021, "No Kin In The Game", NBER Working Paper).

Theory: War as Rent-seeking

Introduction

- This approach takes conflict as given, and focuses on how many resources are devoted to "appropriative activities" in equilibrium.
- It can be used to explain intensity or duration of conflict.
- Some classic authors are Jack Hirshleifer, Herschel Grossman, Stergios Skaperdas, Kai Konrad.
- Recent extension to network spillovers: König, Michael D., Dominic Rohner, Mathias Thoenig, and Fabrizio Zilibotti, 2017, "Networks in conflict: Theory and evidence from the great war of Africa", *Econometrica*.

Theory: War as Rent-seeking

Workhorse model 1/3

- Two risk-neutral players, i and j, fight to appropriate a prize **R**.
- Each faces a time constraint: $f + l = 1$, where f=fighting, l=labor.
- Payoff functions:

$$\pi_i = p_i(f_i^*, f_j^*)R + w_i(1 - f_i^*) \quad (1)$$

$$\pi_j = (1 - p_i(f_i^*, f_j^*))R + w_j(1 - f_j^*) \quad (2)$$

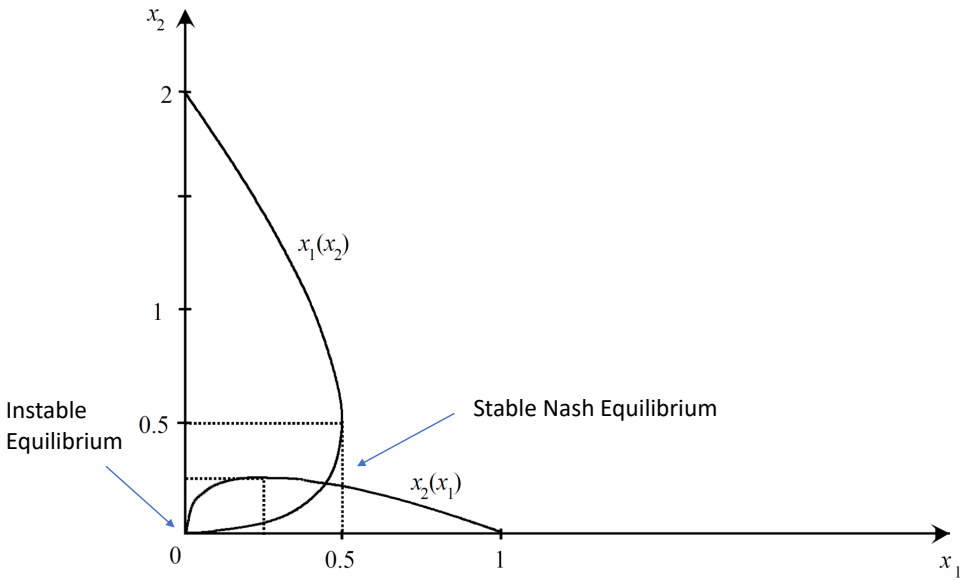
where
  - $*$=equilibrium level
  - p_i=probability of i winning (or alternatively, i's share won)
  - w=wage.

- Contest success function: $p_i = \frac{\rho_i f_i^*}{\rho_i f_i^* + \rho_j f_j^*}$

  where ρ=fighting technology.

Theory: War as Rent-seeking

Workhorse model 2/3



- Adapted from Konrad (2007, Strategy in Contests: An Introduction). Players i and j, with fighting efforts labelled x.

Theory: War as Rent-seeking

Workhorse model 3/3

- The Nash equilibrium appropriation levels become

$$f_i^* = \frac{\rho_i \rho_j w_j R}{(\rho_j w_i + \rho_i w_j)^2} \tag{3}$$

$$f_j^* = \frac{\rho_i \rho_j w_i R}{(\rho_j w_i + \rho_i w_j)^2} \tag{4}$$

- More appropriation takes place when the prize is larger (high R) and when the opportunity costs of fighting are small (low w).

- Waste of war: $R \frac{2\rho_i \rho_j w_i w_j}{(\rho_j w_i + \rho_i w_j)^2}$

Theory: War as Rent-seeking

Implications

- When $w_i = w_j$, both players select same fighting efforts $f_i^* = f_j^*$, and success is exclusively determined by technology, $p_i = \frac{\rho_i}{\rho_i + \rho_j}$.

Hirshleifer's "paradox of power" (1991, EP)

Put $\rho_i = \rho_j$ and $w_i < w_j$. Then, $f_i^* > f_j^*$ and $p_i = \frac{w_j}{w_j + w_i} > 0.5$. The "poorer" player fights harder and thus has better chances of winning

  - Examples: Bolchewiki in Russia 1917, Fidel Castro and rebels in Cuba 1959.

- Extensions include endogenous cake size, budget constraints (Bevia and Corchon, 2010, GEB), other functional forms of contest success functions (cf. Skaperdas, 1996, ET) etc.

Peace Policies: Securities, Wages, Democ., Building Trust

Interdependence and Trust - Quote of Jervis describing "security dilemma"

"(...) anarchy encourages behavior that leaves all concerned worse off than they could be, even in the extreme case in which all states would like to freeze the status quo. This is true of the men in Rousseau's "Stag Hunt". If they cooperate to trap the stag, they will all eat well. But if one person defects to chase a rabbit –which he likes less than stag– none of the others will get anything. Thus, all actors have the same preference order, and there is a solution that gives each his first choice: (1) cooperate and trap the stag (the international analogue being cooperation and disarmament); (2) chase a rabbit while others remain at their posts (maintain a high level of arms while others are disarmed); (3) all chase rabbits (arms competition and high risk of war); and (4) stay at the original position while another chases a rabbit (being disarmed while others are armed). Unless each person thinks that the others will cooperate, he himself will not." (Jervis, 1978: 167-8).

Peace Policies: Securities, Wages, Democ., Building Trust

Interdependence and Trust - Stag-hunt game

		Group B: C	Group B: D
Group A	C	c, c	$h - l, h$
	D	$h, h - l$	$h - \alpha l, h - \alpha l$

where $c > h$, $\alpha < 1$.

- Multiple equilibria: (C,C) and (D,D)!
- This is a coordination game / common-interest-game. With distrust players may end up in the bad equilibrium (D,D).