CONTESTS FOR POWER

Stergios Skaperdas

University of California, Irvine

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Definining Contests for Power

Economic or social situations that

- Can be thought of as contests
  [Two or more agents choose costly efforts that are *adversarially* combined]
  and
- Efforts have *no positive externalities* on third parties.

Examples of contests for power

- Conflict and wars
- Organized crime
- Lobbying and rent-seeking
- Litigation
- Pure influence activities in organizations
- Public Relations, spin-doctoring
- Managers vs. shareholders
  Not under consideration:
  -tournaments with productive effort.
  -sports contests

Classics on Power-seeking

- The first principle of economics is that every agent is actuated only by self-interest. The workings of this principle may be viewed under two aspects, according as the agent acts without or with, the consent of others affected by his actions. In wide senses, the first species of action may be called **war**; the second, **contract**.
  Edgeworth, *Mathematical Psychics*, 1881
- [T]he efforts of men are utilized in two different ways: they are directed to the **production** or transformation of economic goods, or else to the **appropriation** of goods produced by others.
  Vilfredo Pareto, *Manual of Political Economy*, 1906 [1972, p. 341]

Instruments of power I: Violence

Instruments of power II: Persuasion

Persuasion and Violence

This Presentation

- Definining Power
- Costs of power-seeking very large.
- Costs of power-seeking depend on governance and norms.
- Allocational effects in General Equilibium
- How empirically plausible are first-best, Nirvana economic models?
- Crucial role of governance

Some References

- 2011 World Development Report on *Conflict and Development* (World Bank, forthcoming)
- Garfinkel, Michelle R. and Skaperdas, Stergios (eds) *The Oxford Handbook of the Economics of Peace and Conflict* (forthcoming; abbreviated as OUP)
- Garfinkel, Michelle R. and Skaperdas, Stergios "Economics of Conflict: An Overview," in Sandler and Hartley (eds), *The Handbook of Defense and Peace Economics,* 2007, Elsevier.
- DellaVigna, Stefano and Gentzkow, Matthew, "Persuasion: Empirical Evidence," Annual Review of Economics, 2010, 2, 643-669.

Outline

- What is power?
- Technologies of power
- Consequences and costs of conflict and power-seeking
- Bargaining in the shadow of contests
- Productivity and power
- Trade in the shadow of power
- Modern governance
- Conclusions

What is Power?

- Can be answered only with reference to context
- Need to have a model of the context
- Method for defining power: As agents' probabilities of winning contest
- Power is relative
- What if contest is only in the background?

Technologies of power I: Conflict

- $p_1(M_1, M_2) = prob[Y_1 > Y_2] = prob[h(M_1, \theta_1) > h(M_2, \theta_2)]$

  M_i =military capacity
  Y_i ="performance"
  θ_i =error
  (for example: $h(M_i, \theta_i) = M_i + \theta_i$)

- $p_i(M_i, M_{-i}) = \begin{cases} \frac{f(M_i)}{\sum_{j=1}^{n} f(M_j)} & \text{if } \sum_{j=1}^{n} f(M_j) > 0; \\ \frac{1}{n} & \text{otherwise.} \end{cases}$

- Stochastic and Axiomatic foundations
- Very few empirical estimates

  Jia and Skaperdas (OUP, 2011)

Technologies of power II: Persuasion

- Probability of Audience (judge, policy-maker, voter, consumer) choosing alternative 1:

$$p_1(e_1, e_2) = \frac{\lambda\pi\phi f(e_1)^\mu}{(1-\pi)(1-\phi)f(e_2))^\mu + \lambda\pi\phi f(e_1)^\mu}$$

Probability of 1 winning depends on:

(i) The *truth* (and the ability to discrimate who is right), represented by parameters $\phi \in [0, 1]$ [Interpretation of ϕ as degree of property rights protection.]

(ii) the *preconceptions or bias* of the Audience, represent by the prior π and the psychological parameters λ and μ;

(iii) the *efforts* of the two sides (e_1 and e_2).

Skaperdas and Vaidya (2009, ET, forthcoming)

Technologies of power II: Persuasion

- How the previous functional form can be derived:
  Audience decides between the two policies, proposed by Contestants 1 and 2.

1. 1 expends e_1 and 2 expends e_2 to gather evidence in their favor.
2. Based on evidenence, the Audience makes an inference (i.e. derives posterior probabilities) about which policy is right.
3. Given posterior belief, the Audience makes a decision on which policy to choose.

Technologies of power II: Persuasion

- Alternative, "difference" functional form:

$$p_1(e_1, e_2) = \pi + \frac{\alpha}{2}[\phi h(e_1) - (1-\phi)h(e_2)]$$

  where $h(e_1)$ and $h(e_2)$ are themselves probabilities

Contests with versions of this form examined by Baik (EJPE, 1996) and Che and Gale (GEB, 2000)

The empirical relevance of power-seeking

- Defense Expenditures (2.6% of world GDP in 2008; varies from less than 1% to more than 10%)
- Internal security costs of ordinary crime.
- Distributional and Social conflict (strikes and lockouts, protests, military coups, ethnic, religious, or class rivalries, terrorism)
- Civil wars (since WWII, in more than 73 countries with 20 million deaths and large other direct economic costs – arming, destruction, underutilization of resources; Collier et. al., World Bank, 2003)
- Absence, or costly enforcement, of property rights (e.g., land).
- Other welfare costs of conflict (Blomberg and Hess, OUP, 2011: on average 8% of consumption; large variance)

The empirical relevance of power-seeking

- Organized crime
- Transnational resource contestation (Oil: Central Asia, South China Sea; Water: Nile, Middle East, South Asia) (Klare, 2001)
- Latest estimates of the cost of the Iraq and Afghanistan Wars: $4-6 trillion (Stiglitz and Bilmes, OUP, 2011)
- Great power rivalries – future "peer competitors" in multipolar world?

-Costs of conflict and appropriation overwhelm costs of many other distortions.

-Can these costs just be considered "frictions?"

-Does the existence and size of such costs matter?

-If yes, how?

Bargaining in the Shadow of Conflict: The costs of power-seeking

- "Cross-my-heart" society (Schelling, 1960) vs Hobbesian jungle
- Example of bargaining in the shadow of conflict
  [Partly based on Anbarci, Skaperdas, and Syropoulos, JET, 2002]
  -Total (gross) income: Y.
  -Secure income of $1: \sigma_1 Y$; secure income of $2: \sigma_2 Y$.
  -Insecure, contested income: $(1-\sigma)Y$ where $\sigma = \sigma_1 + \sigma_2 \in [0,1]$
  -Fighting destroys part of income; winner receives $\phi(1-\sigma)Y$
  $(\phi \in (0,1))$
  -Incentive to bargain and settle in the shadow of conflict.

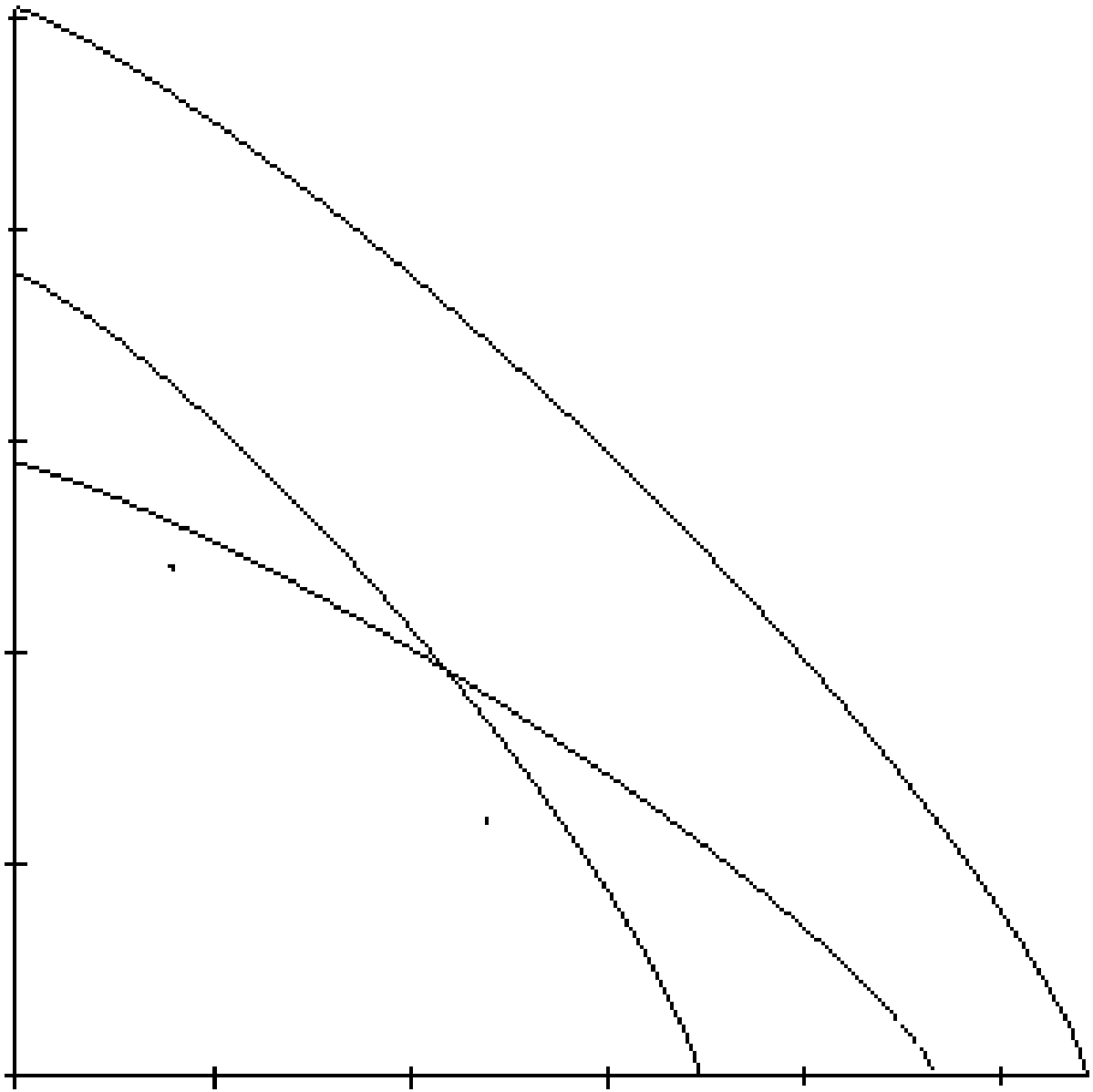
Bargaining (continued)

1. 1 and 2 choose costly levels of effort, e_1 and e_2.
2. Choice between fighting and settlement.
   If either side chooses to fight, the two sides fight with the following expected incomes:
   $y_1(e_1, e_2) = \sigma_1 Y + \frac{e_1}{e_1+e_2}\phi(1-\sigma)Y - e_1$
   $y_2(e_1, e_2) = \sigma_2 Y + \frac{e_2}{e_1+e_2}\phi(1-\sigma)Y - e_2$
3. If both sides choose to settle, then their incomes are the following:

$$y_1(e_1, e_2) = \sigma_1 Y + v^{\beta}(e_1, e_2)(1-\sigma)Y - e_1$$

$$y_2(e_1, e_2) = \sigma_2 Y + (1 - v^{\beta}(e_1, e_2))(1-\sigma)Y - e_2$$

Bargaining (continued)



Bargaining (continued)

Settlement iff

$$v^{\beta}(e_1, e_2) \geq \frac{e_1}{e_1 + e_2}\phi$$

and,

$$(1 - v^{\beta}(e_1, e_2)) \geq \frac{e_2}{e_1 + e_2}\phi$$

Class of rules parametrized by $\beta \in [0, 1]$:

$$v^{\beta}(e_1, e_2) = \beta\frac{e_1}{e_1 + e_2} + (1 - \beta)\frac{1}{2}$$

Includes the following possibilities:
a. $\beta = 0$ (example of a "cross-my-heart" society).
b. $\beta = \beta_l \equiv 1 - 2\sqrt{\phi(1-\phi)}$(minimun sustainable)
c $\beta = \phi$ (any symmetric axiomatic bargaining solution, including the Nash and Kalai-Smorodinsky solutions).
d. $\beta = 1$ (only efforts matter for bargaining)

Bargaining and the costs of power-seeking

Nash equilibrium efforts: $e_1^\beta = e_2^\beta \equiv e^\beta = \frac{\beta(1-\sigma)Y}{4}$

Equilibrium incomes: $y_i^\beta(e^\beta, e^\beta) = \sigma_i Y + \frac{2-\beta}{4}(1-\sigma)Y \quad (i = A, B)$

Cost of effort (or, power-seeking) and incomes determined by

- Governance (security levels; endogenized later)
- Norms and conventions of division; ability to commit; "cross-my-heart".
  - Rich countries develop state capacity, while poor countries do not.
  - Outsiders may indirectly help or hinder Peace.

Embedding contests in General Equilibirum: Productivity vs power

- Two Parties: 1 and 2;

-two material goods: fish (f) and corn (c).
-$1's$ endowment R_1 converted one-for-one into fish
-$2's$ endowment R_2 one-for-one into coconuts

- -Utility function, $U(f_i, c_i)$, linearly homogeneous. (Formally, the same problem as having a final good produced by two inputs.)
- Edgeworth's (1881) formulation
- What is the most reasonable process by which the two sides will arrive at an exchange of some of $1's$ fish for some of $2's$ corn?
- What determines these exchange ratios or prices?

General Equilibrium (continued)

- Strong tendencies:

  -Goods that are more valued have higher prices
  -Those who hold more valued goods receive higher incomes and utility.

- Under competitive pricing

  $1's$ equilibrium utility: $R_1 \frac{\partial U(R_1,R_2)}{\partial f}$
  $2's$ equilibrium utility: $R_2 \frac{\partial U(R_1,R_2)}{\partial c}$
  $\frac{\partial U(R,R)}{\partial f} > \frac{\partial U(R,R)}{\partial c}$

(True if, for example, $U(f,c) = f^{\alpha}c^{1-\alpha}$ and $\alpha > 1/2$)

General Equilibrium (continued)

Major Caveat: Use of force as an option. Instead of *cooperative*, relationship is *adversarial*

$$\begin{aligned} R_1 &= f + g_1 \\ R_2 &= c + g_2 \end{aligned}$$

g_i $(i = 1, 2)$: "Guns"

Quantities of fish and corn now variable

"Total utility": $U(f, c) = U(R_1 - g_1, R_2 - g_2)$

Guns used to determine distribution.

Payoff functions:

$V^1(g_1, g_2) = p(g_1, g_2)U(R_1 - g_1, R_2 - g_2)$

$V^1(g_1, g_2) = (1 - p(g_1, g_2))U(R_1 - g_1, R_2 - g_2)$

[From Skaperdas, AER, 1992.]

Productivity vs power (continued)

$$\frac{\partial V^1(g_1, g_2)}{\partial g_1} = \frac{\partial p(g_1, g_2)}{\partial g_1} U(R_1 - g_1, R_2 - g_2)$$

[Marginal Benefit of guns]

$$- p(g_1, g_2) \frac{\partial U(R_1 - g_1, R_2 - g_2)}{\partial f}$$

[Opportunity cost of guns]

2 *more powerful* $(g_1^* < g_2^*)$
iff $\frac{\partial U(R_1 - g_1^*, R_2 - g_2^*)}{\partial f} > \frac{\partial U(R_1 - g_1^*, R_2 - g_2^*)}{\partial c}$,
(2 *less marginally productive* at the equilibrium point)
$\frac{\partial U(E,E)}{\partial f} > \frac{\partial U(E,E)}{\partial c}$.

Productivity vs power (continued)

Observations:

- More productive get less
- Peasants have been receiving less compensation than specialists in violence (lords, kings, mafiosi)
- Robustness checks (e.g., becoming more productive, lowers one's compensation)
- Dynamic consequences of distribution (incentives for innovation and investment; Baumol, 1990, Gonzalez, 2005).
- What about influence activities in organizations? (Milgrom and Roberts)
- Re: Identifying wages as proportional to marginal productivity in empirical studies.

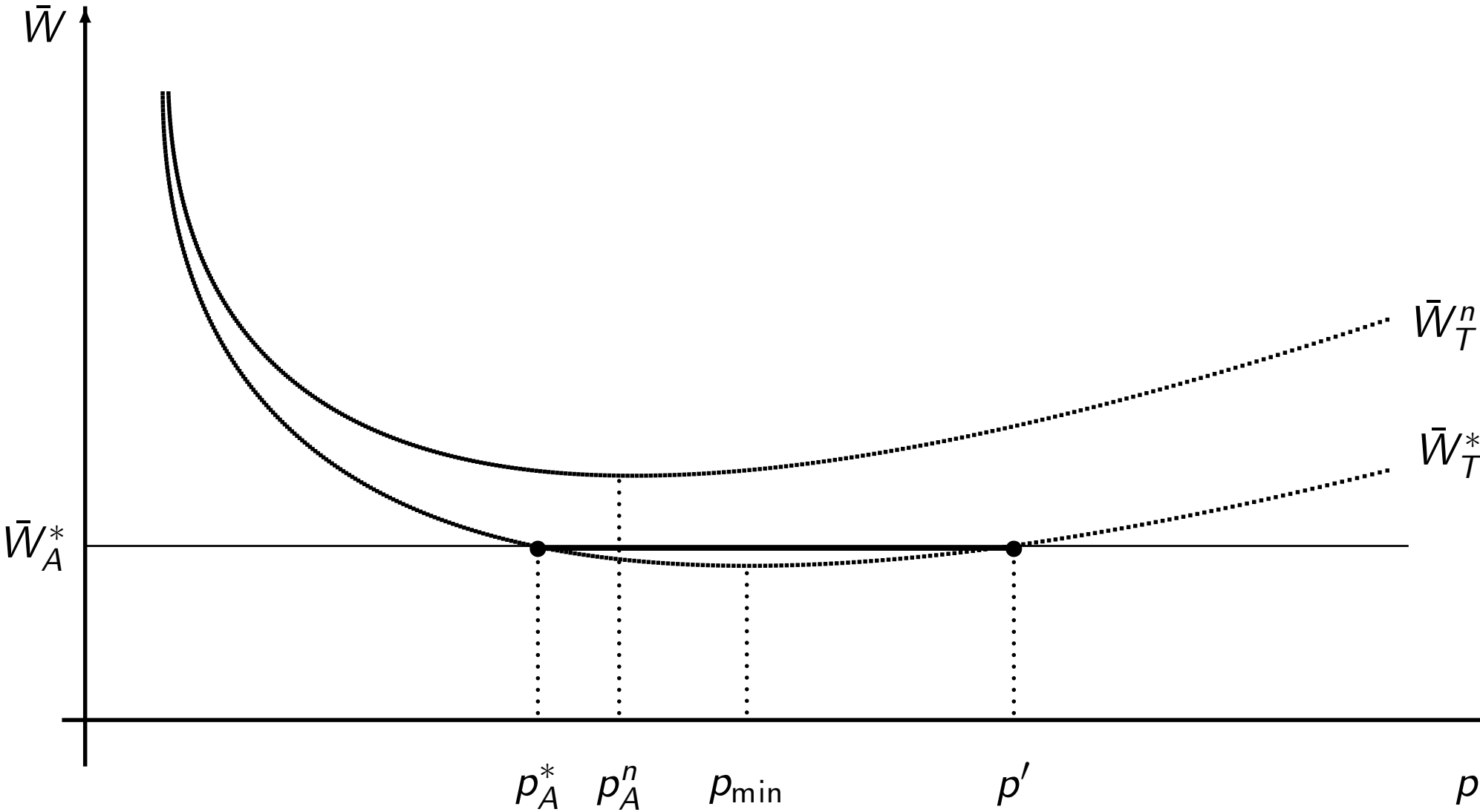
Trade in the Shadow of Power

- Findlay and O'Rourke (Power and Plenty, 2007; OUP, 2011)
- Security externality of trade; liberalism vs. realism. Is China a "strategic partner" or a "strategic rival?"
- Regional rivalries
- Domestic rivalries

- Model with Insecure resource ("oil")

-Groups or states contest with "guns"
-Guns vs. Butter
-Valued: Oil and Butter
(Models in Skaperdas and Syropoulos, AER, 2001, and Garfinkel, Skaperdas, and Syropoulos, JIE, 2008)

Trade in the Shadow of Power (continued)



Trade in the Shadow of Power (continued)

- Insecurity shifts welfare down.
- Countries importing oil gain unambiguously.
- Exporters of oil lose as long as its price is not too high.
- Tendency to over-export oil

[Reversal of comparative advantage relative to the absence of conflict (over a certain price range)]

- Price range over which increasing international price of oil associated with reduction in welfare (natural resource curse)

Interventions on exchange

Second-best explanations of seemingly inefficient policies:

- Wage subsidies (Grossman, AER, 1995)
- Land reform (Grossman, 1994)
- Generic interventions (Dal Bo and Dal Bo, JEEA, 2010; OUP, 2011)

On the role of Governance

- Equilibrium incomes in bargaining model above:

$$y_i^{\beta}(e^{\beta}, e^{\beta}) = \sigma_i Y + \frac{2-\beta}{4}(1-\sigma)Y \quad (i = A, B)$$

- σ and β are endogenous in the long-run. Functions of:

  -History
  -Third parties
  -Actions of the parties themselves

- Endogenized in a dynamic setting (McBride, Milante, and Skaperdas, JCR, 2011)
- Importance of the State's ability to commit (North, Wallis, and Weingast, 2009).

Conclusion

- Use of contests to study power: *Adversarial* input combination is key
- Violence and Persuasion as two instruments of power
- Costs and economic significance of power-seeking (can be thought of as costly definition and enforcement of property rights)
- Governance and norms can reduce costs.
- Distortions of economic activity due to power.
- How empirically plausible are first-best models?
- Role of governance critical
- Persuasion especially promising area of research.