The Invisible Fist: How Potential Power Coerces Concessions

William Spaniel

University of Rochester

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- Literature gives conditions:
  1. Bargaining = zero sum; nukes improve bargaining position
  2. Preventive war no problem
  3. Cost of nukes $<$ additional concessions

Bargaining?

- Why not buy off potential proliferator?
- My research: $\exists$ credible settlements mutually preferable to proliferation

Key Features

- Investment must be endogenous, costly
- Interaction must continue through time
- Declining state must be strategically vulnerable

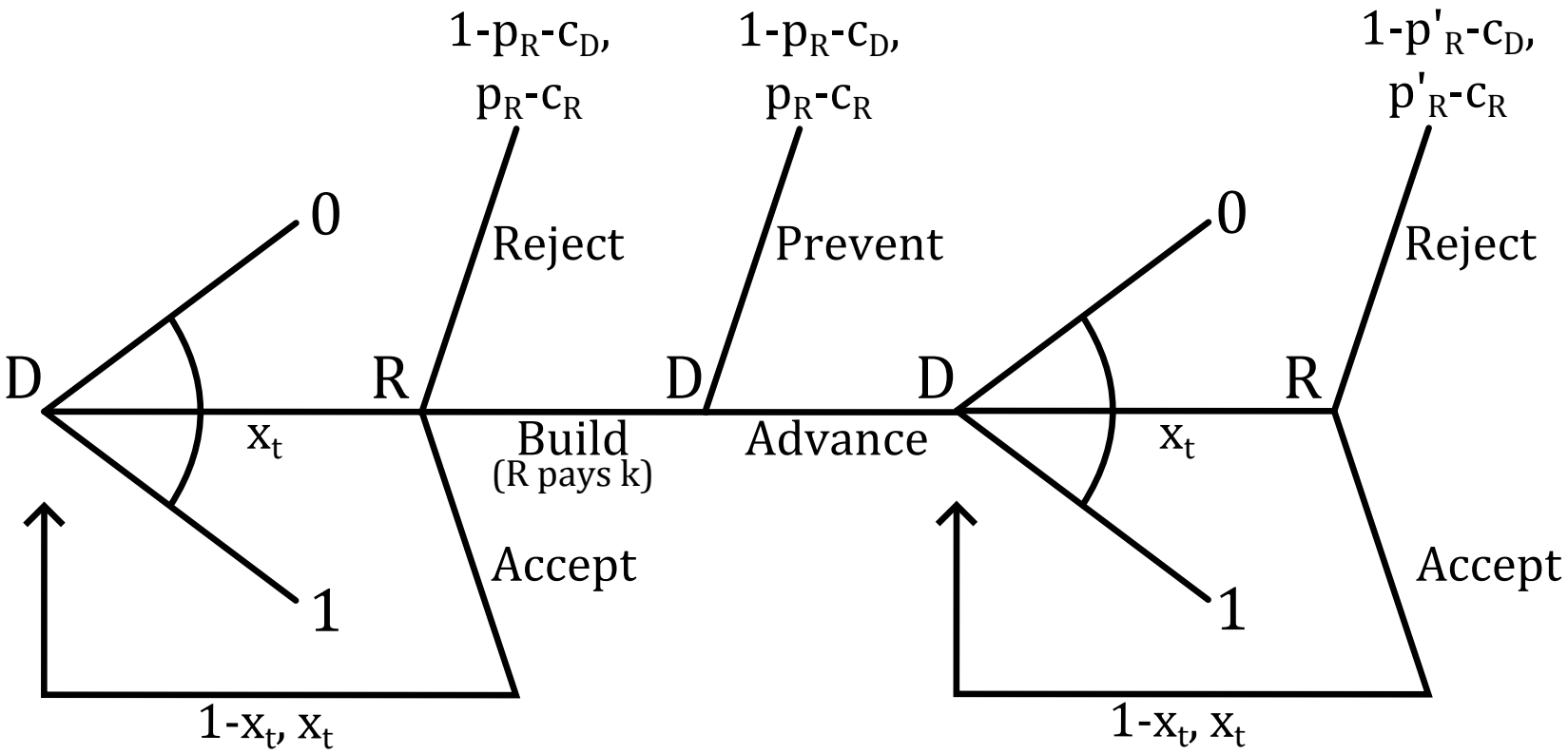
Strategic Environment (Pre-Shift)

- Two actors: D(eclining) and R(ising)
- Infinite time horizon; $\delta \in (0, 1)$
- D offers $x_t \in [0, 1]$ every period
- R accepts, rejects, or builds
  - Accept $\Rightarrow$ same bargaining problem next period
  - Reject $\Rightarrow$ war $\Rightarrow$ R wins with probability p_R, states pay costs $c_i > 0$
  - Building costs $k > 0$. D prevents or advances to post-shift state

Strategic Environment (Post-Shift)

- D offers $x_t \in [0, 1]$
- R accepts or rejects.
  - Accept $\Rightarrow$ same bargaining problem next period
  - Reject $\Rightarrow$ war $\Rightarrow$ R wins with probability $p'_R > p_R$, states pay costs $c_i > 0$

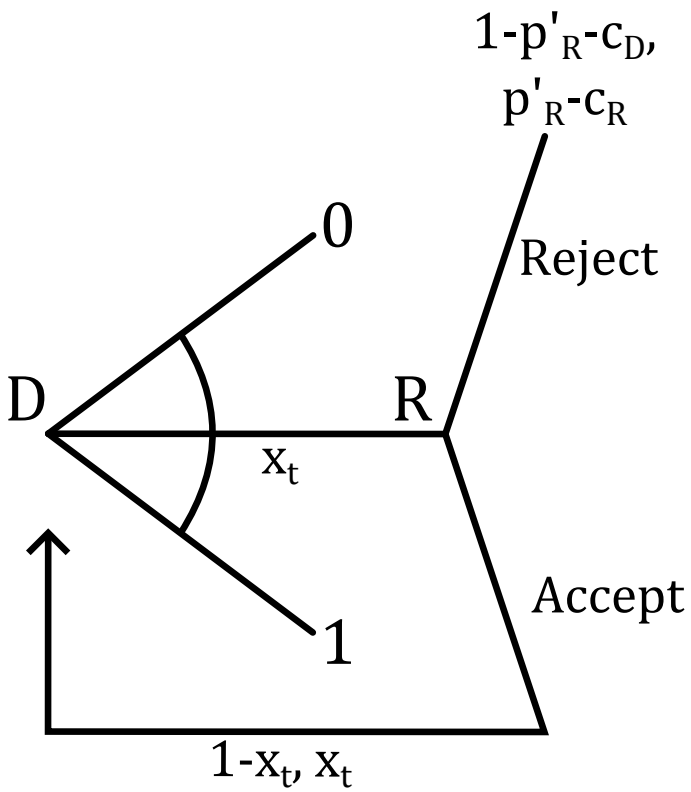
Game Tree


1-p_R-c_D,
p_R-c_R
1-p_R-c_D,
p_R-c_R
1-p'_R-c_D,
p'_R-c_R
0
Reject
Prevent
0
Reject
D
R
D
D
R
x_t
Build
(R pays k)
Advance
x_t
Accept
Accept
1
1
1-x_t, x_t
1-x_t, x_t

Equilibrium Concept

- Infinitely repeated game, complete information $\Rightarrow$ stationary Markov perfect equilibrium
- SMPE = SPE + strategies a function of state of the world

Lemma: Peace Post-Shift



- D offers $x_t = p'_R - c_R$
- R accepts

"Too Hot" to Build

Proposition 1

Sufficiently large power shift $\Rightarrow$ declining state prevents if rising state builds $\Rightarrow$ declining state offers no concessions, rising state never builds

- $p'_R > p_R + \frac{c_D + c_R}{\delta}$
- Intuition: Power shift too hot

"Too Cold" to Build

Proposition 2

Sufficiently small power shift $\Rightarrow$ nukes not worth investment $\Rightarrow$ declining state offers no concessions, rising state never builds

- $p'_R < p_R + \frac{k(1-\delta)}{\delta}$
- Intuition: Power shift too cold

Just Right to Build?

Proposition 3 (Butter-for-Bombs)

Medium-level power shift and building cost great $\Rightarrow$ declining state offers immediate concessions $\Rightarrow$ rising state accepts and never builds

- D offers $\underbrace{p'_R - c_R}_{\text{Lemma}} - \frac{k(1-\delta)}{\delta}$
- D extracts investment cost

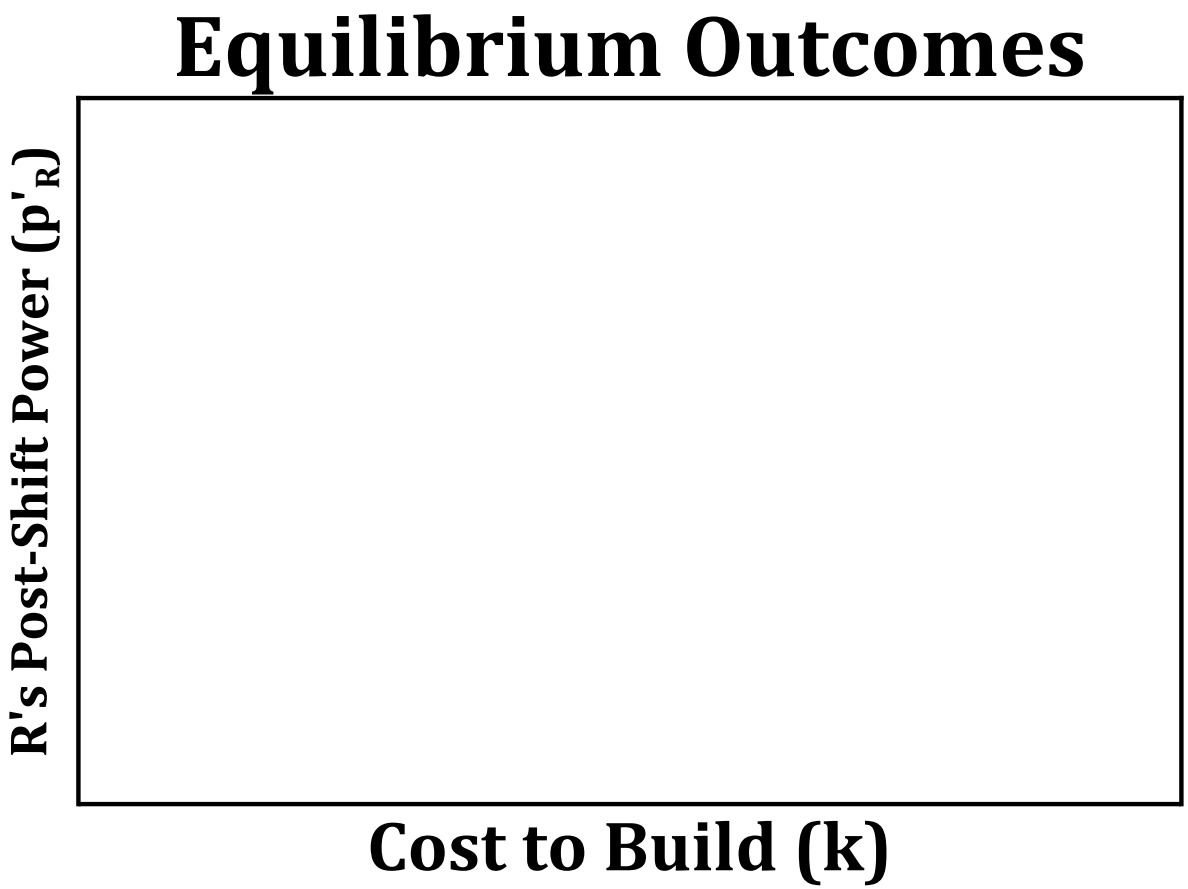
Just Right to Build?

Proposition 3 (Butter-for-Bombs)

Medium-level power shift and building cost great $\Rightarrow$ declining state offers immediate concessions $\Rightarrow$ rising state accepts and never builds

- D offers $\underbrace{p'_R - c_R}_{\text{Lemma}} - \frac{k(1-\delta)}{\delta}$
- D extracts investment cost
- Investment cost small $\Rightarrow$ D prefers taking everything upfront, letting R proliferate, and making great concessions after

Demand for Nukes Low



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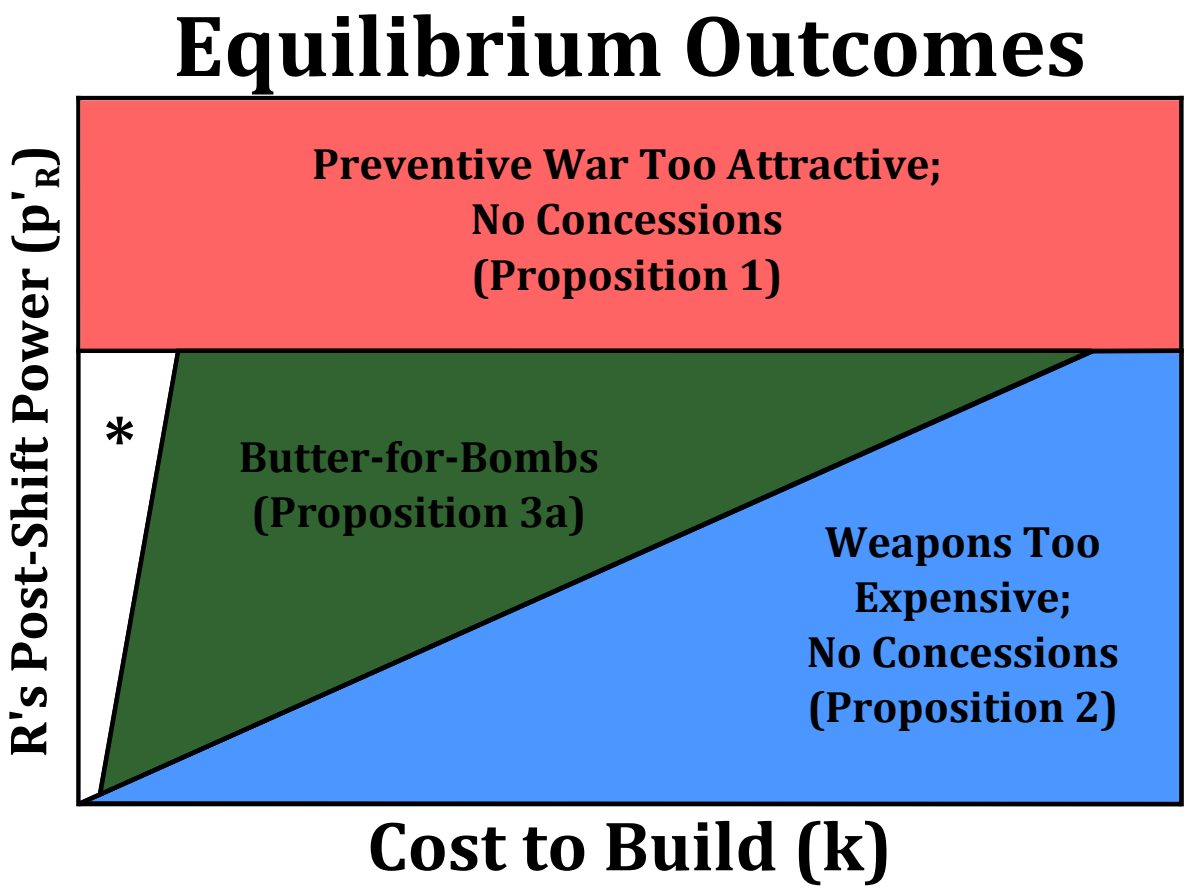

Takeaway Points

- Model: bargaining shrinks demand
  - States need conventional defense
  - States need industry and rivals
  - Declining states can bribe some of the remaining states

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- Model: bargaining shrinks demand
  - States need conventional defense
  - States need industry and rivals
  - Declining states can bribe some of the remaining states
- Rational explanation for proliferation: nukes are cheap or bargaining problem

End

Questions?