The Invisible Fist: How Potential Power Coerces Concessions

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Naive Iran Policy?

Iran must comply with U.N. Security Council resolutions...we have offered Iran a clear path toward greater international integration if it lives up to its obligations...but the Iranian government must now demonstrate...its peaceful intentions or be held accountable to...international law. (Obama 2009)

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- Theoretical puzzle: Current bargaining models $\Rightarrow$ realized power $=$ concessions

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- Policy puzzle: Iranian duplicity

Butter-for-Bombs in History

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- Examples
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  - North Korea (Nukes, Long-Range Missiles)
  - Libya (Nukes, Chemical Weapons)
  - Cold War allies (South Korea, Australia)

Critical Insight

- Bombs do not grow on trees.
  - Weapons = costly
  - Why pay if you already get what you want?

Butter-for-Bombs Works (Sometimes)

- Threat to build credible & cost large $\Rightarrow$ butter-for-bombs works
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  - Potential power = *invisible fist*
- Cost small $\Rightarrow$ *declining state's* opportunism causes rising state to build
  - Pareto dominated

Modeling Butter-for-Bombs

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

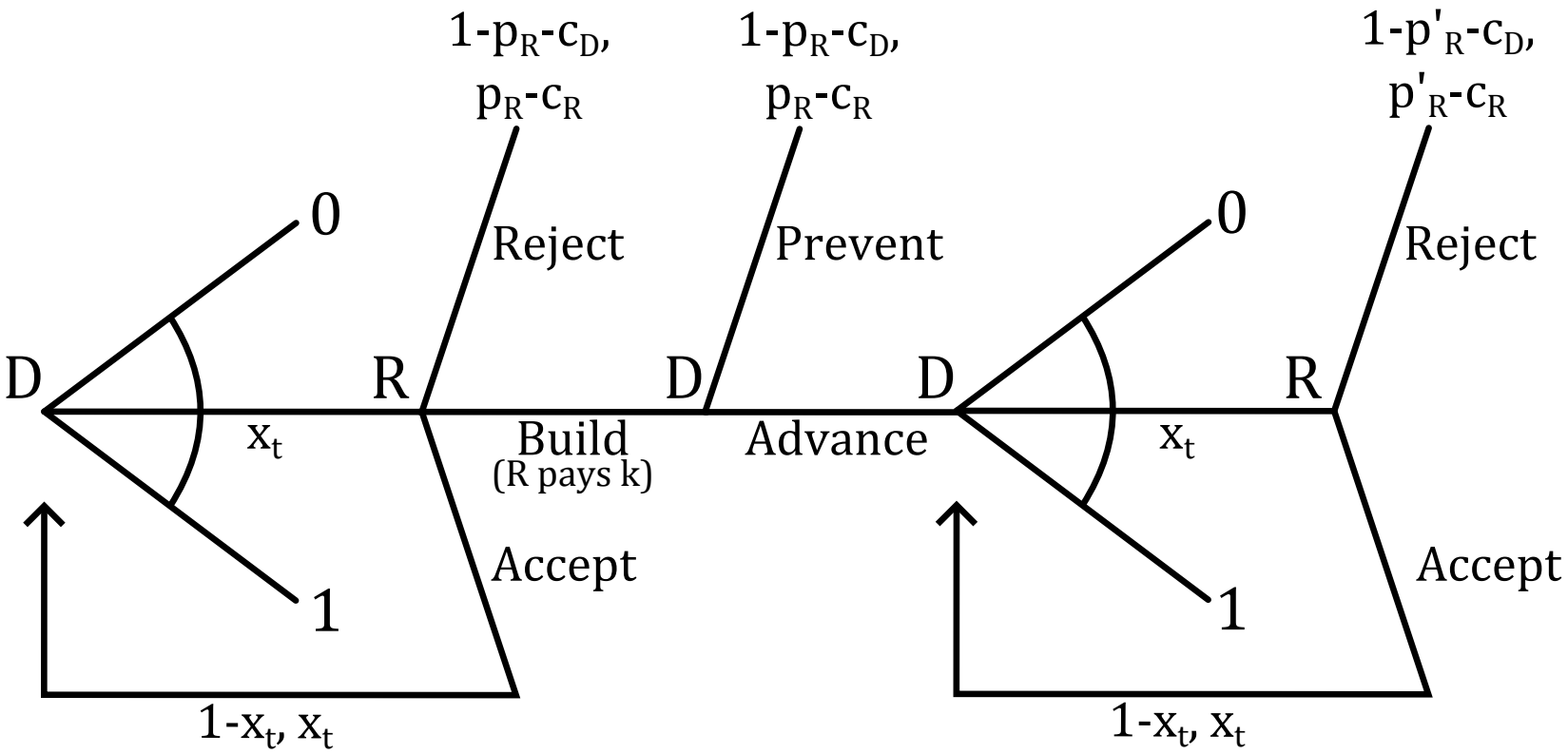
Strategic Environment (Pre-Shift)

- 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 $c_i > 0$

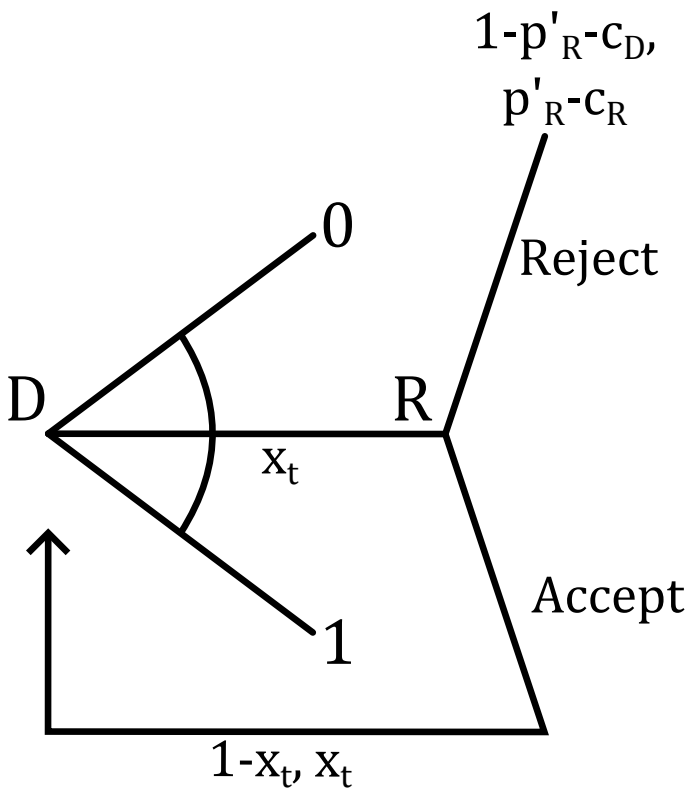
Game Tree


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 discount factors $\Rightarrow$ declining state prevents if rising state builds $\Rightarrow$ declining state offers no concessions, rising state never builds

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

"Too Cold" to Build

Proposition 2

Sufficiently small discount factors $\Rightarrow$ rising state too impatient to invest $\Rightarrow$ declining state offers no concessions, rising state never builds

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

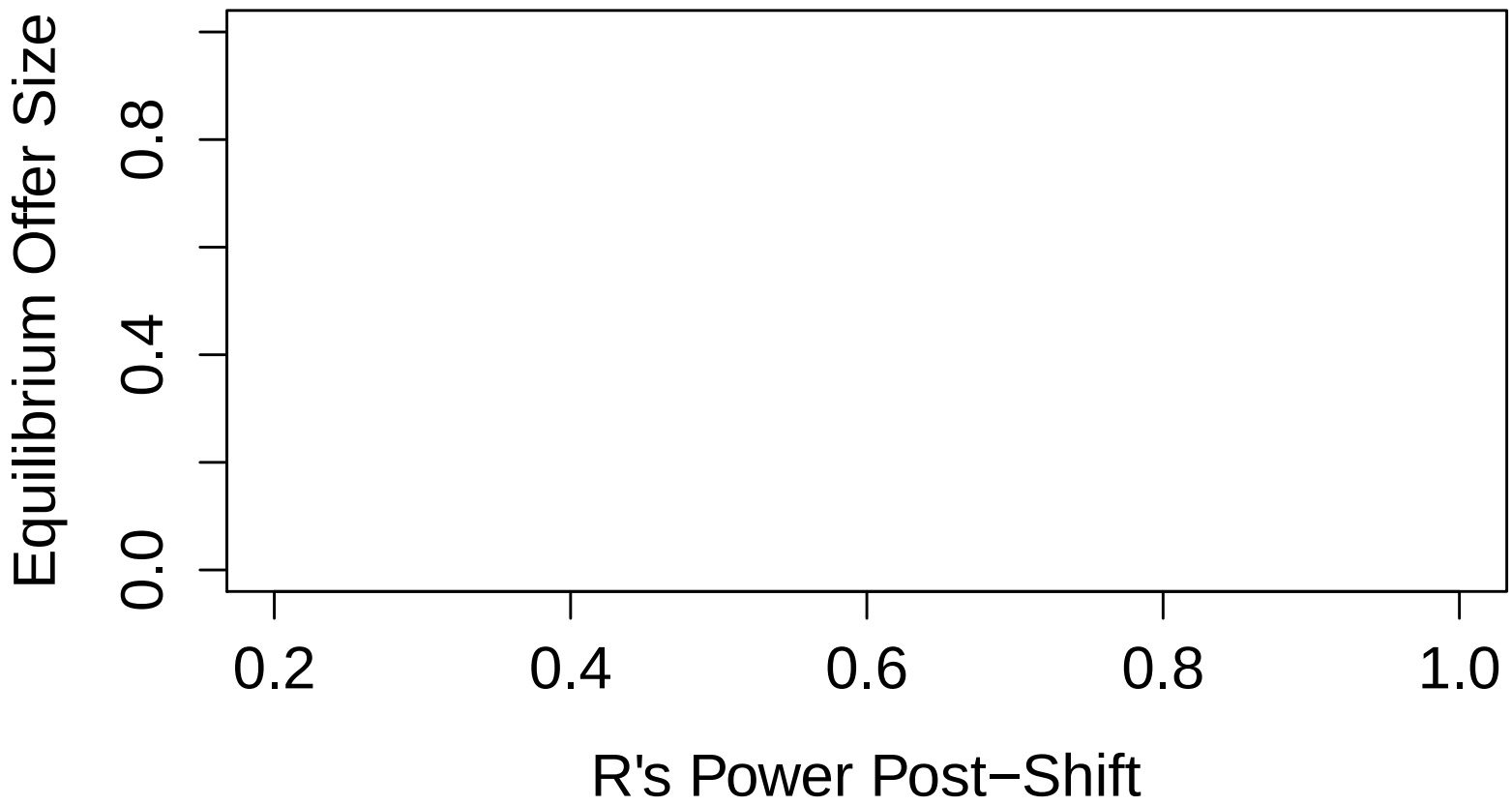
Just Right to Build?

Proposition 3a (Butter-for-Bombs)

Discount factor in middle range 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...For Settlement



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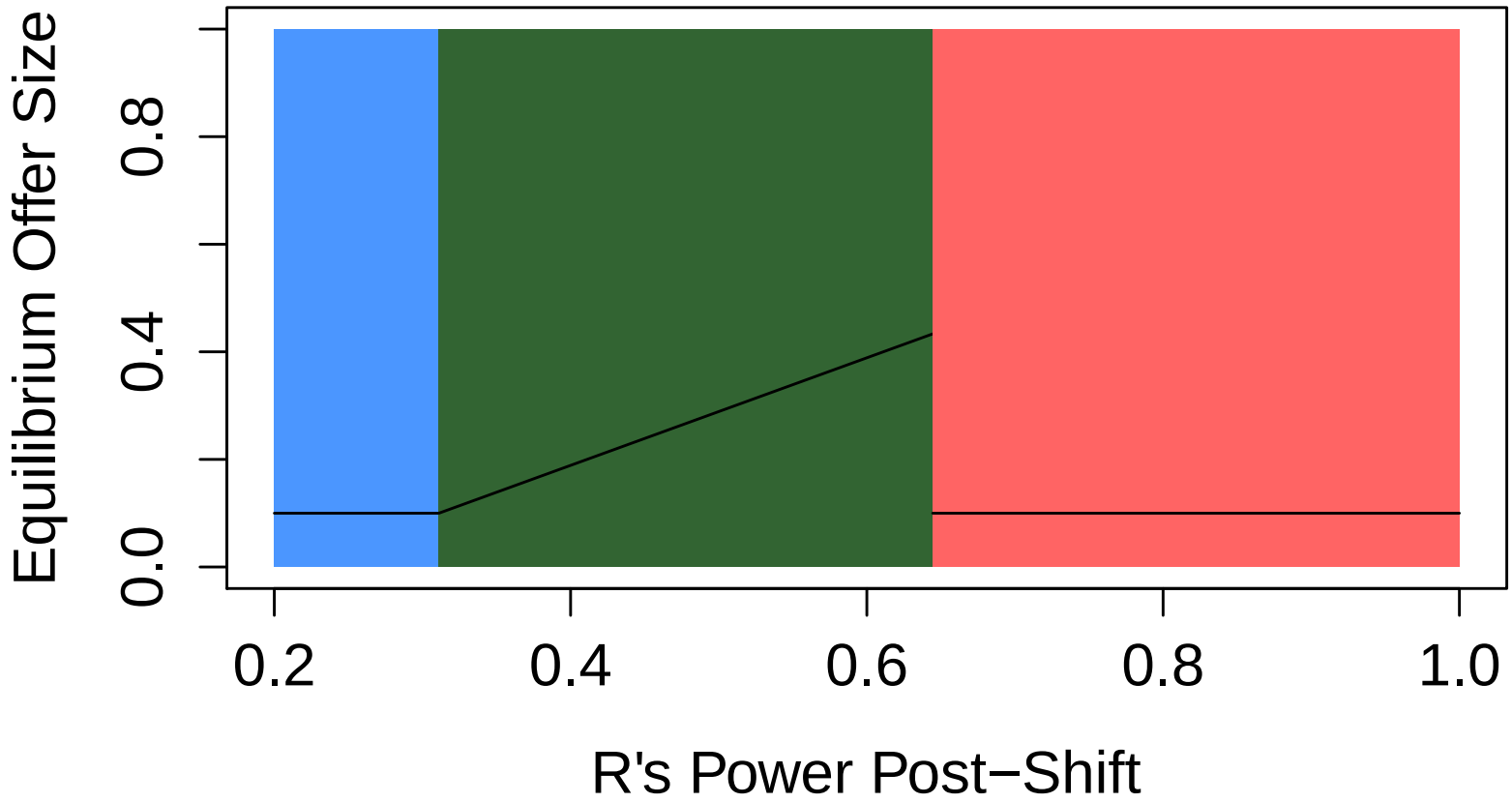
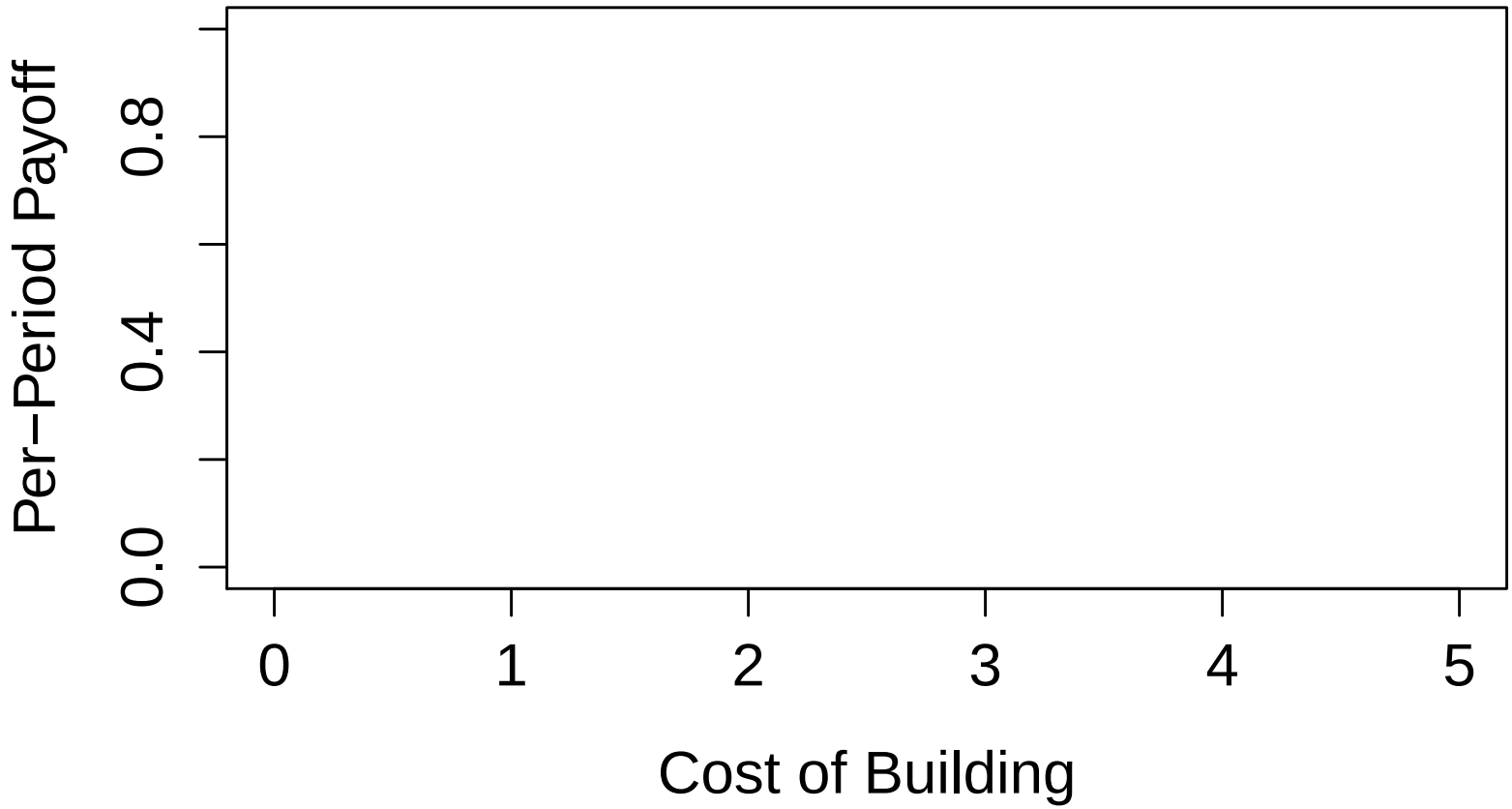


Just Right to Build

Proposition 3b (Investment)

Discount factor in middle range and building cost low $\Rightarrow$ declining state offers 0 in pre-shift stage $\Rightarrow$ rising state builds and receives great concessions in post-shift state

Smaller Costs Pareto Dominated



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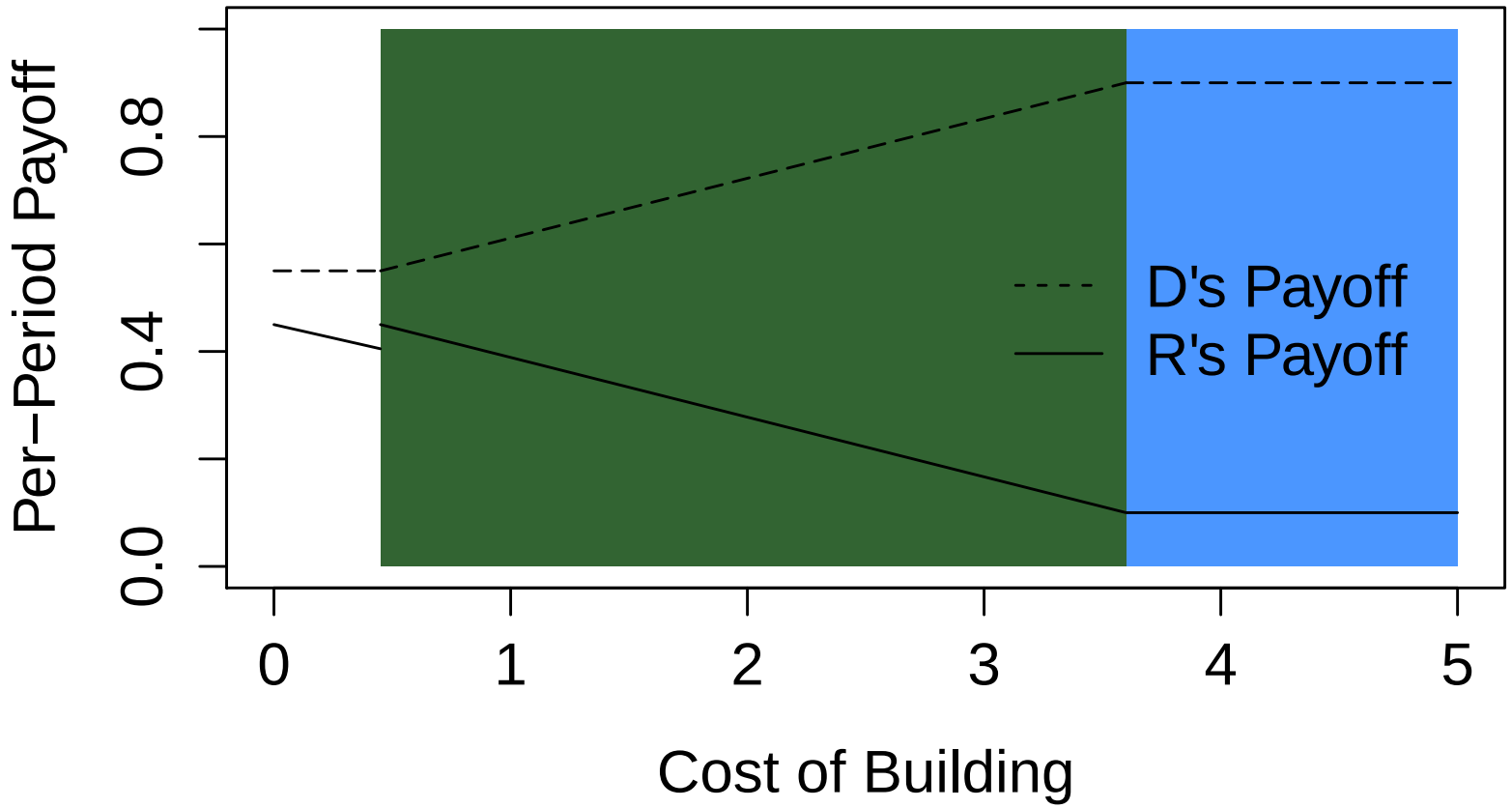

(1) Demand for Nukes Low

- JFK predicted 25 nuclear powers. 9 today. Why so few?
- 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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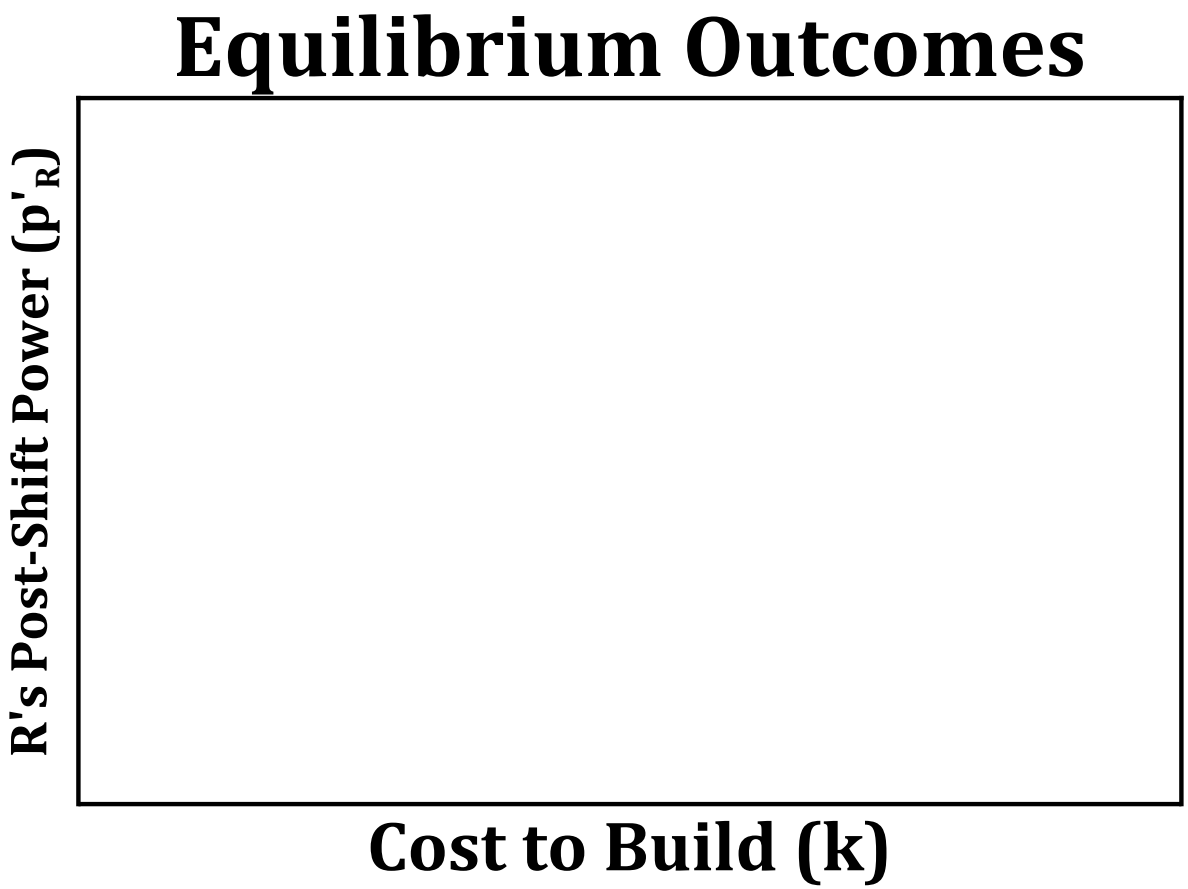

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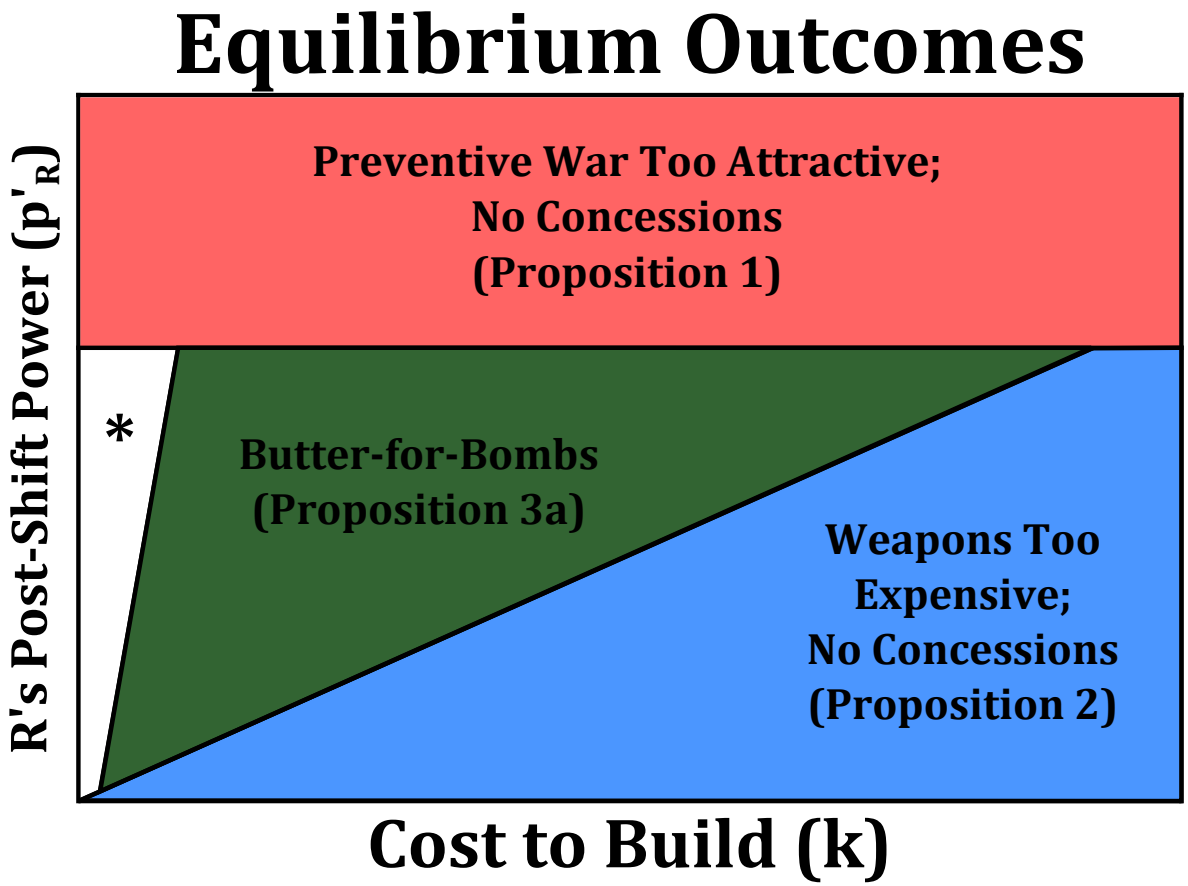


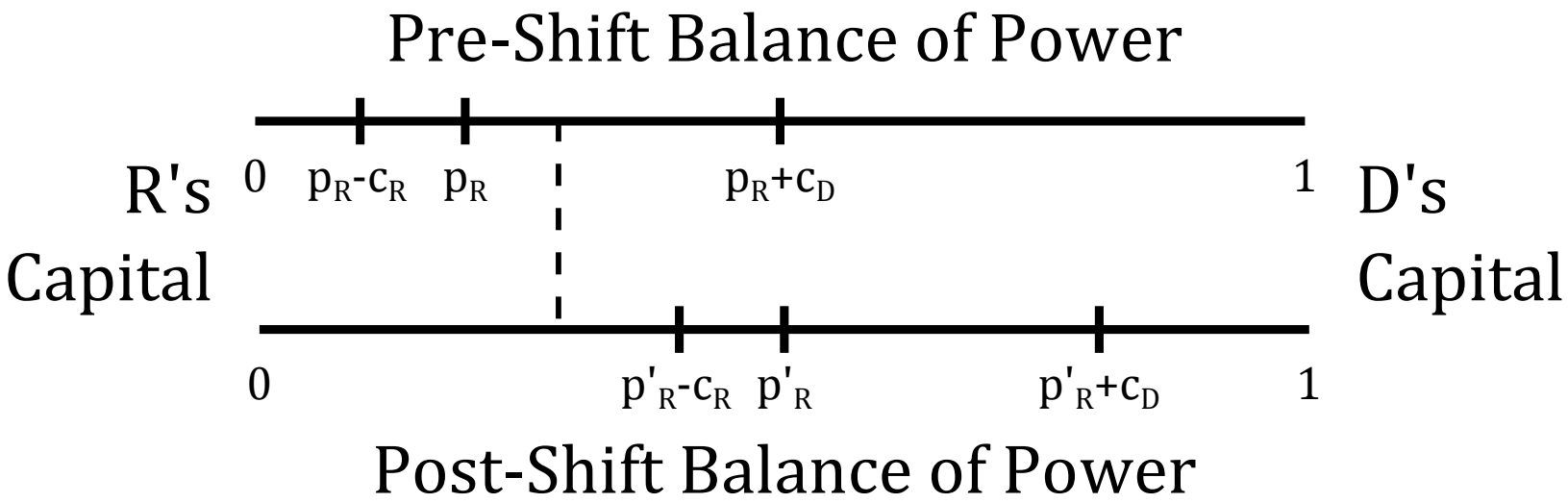
(2) Obama Isn't Naive

- Carrots alone (no sticks) convince rising state not to build in butter-for-bombs agreements

End

Questions?

Appendix: What Does Butter-for-Bombs Look Like?

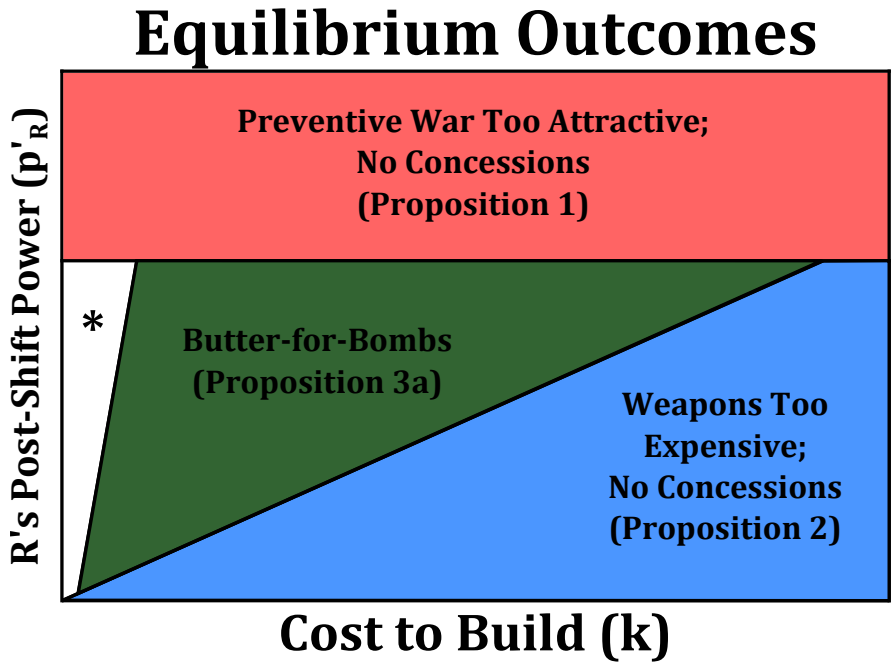


Appendix: What Is k?

- Absolute costs (investment, construction, maintenance).
- Relative costs (resolve).
  - Model standardizes value of bargaining good at 1.

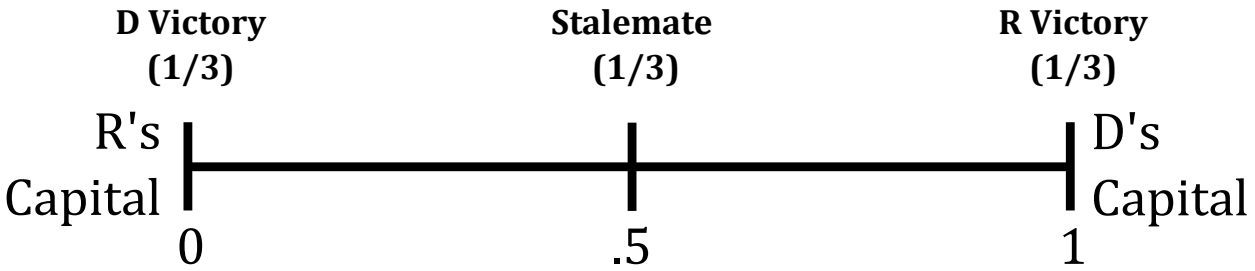
Appendix: Who Negotiates with Whom?

- k is decreasing in the intensity of the security relationship.
- States that care less about the issues do the negotiating!



Appendix: Nukes Defensive?

- p_R = weighted average of all possible war outcomes
- Pre-Shift: D victory possible $\Rightarrow p_R = \frac{1}{2}$



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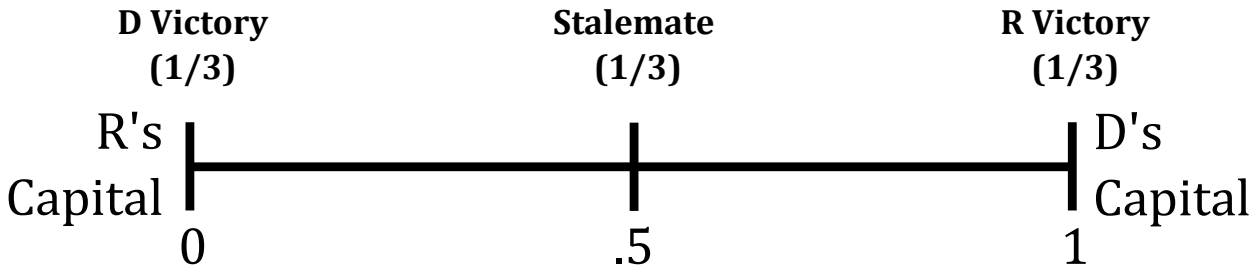
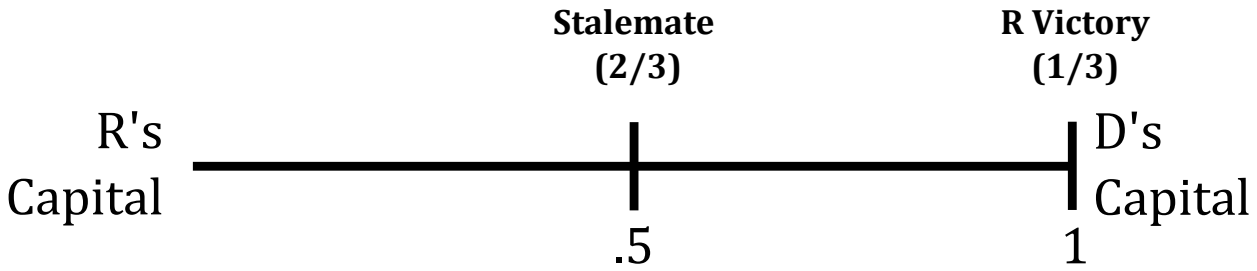


- Post-Shift: D victory not possible $\Rightarrow p'_R = \frac{2}{3}$



- Result: Nukes improve R's average outcome even if never used

Appendix: Carrots vs. Sticks

- Axelrod (1984): "sticks" model
  - Threat of bigger sticks inspires cooperation today
- Invisible Fist: "carrots" model
  - Bigger stick option ruled out by assumption

Appendix: Non-Nuclear Example

- This is a model of tribute.
- "Declining state" pays tribute to the "rising state"; "rising state" does not do the bad thing to the "declining state" in return.
- Stylized fact: Empires extract tribute out of their protectorates without having a large military presence.
- Why don't protectorates rebel?
  - Empires will "shift power" by mobilizing troops to the protectorate.
  - But mobilization is costly. The protectorate can extract this cost out of the empire by offering less tribute.

Appendix: Institutional Puzzle

- States often sign arms control treaties.
- This creates extra costs for the states if they ever want to break the treaty.
- So why bother signing at all?

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- So why bother signing at all?
  - Answer: Rising states have incentive to artificially inflate their investment costs.

Appendix: Endogenous Building Costs

Proposition 4

Suppose the game begins with the rising state choosing a cost level $k > 0$. Then there exists a non-knife-edge set of parameters for which R chooses a cost level strictly bound above 0 in the unique stationary MPE.

- Intuition: When k is low, the declining state earns more by forcing the rising state to build.
- But this means the rising state earns less through bargaining *and* must pay the deadweight loss k.
- R is better off when the costs are greater!