Arms Treaties & the Credibility of Preventive War: Why Did the Soviet Union Proliferate in 1949?

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A Simple Observation

Bad. Costly. Why?
Current literature explains proliferation:

1. Bargaining zero sum
2. Weapons worth cost
3. Preventive war not credible

“[S]ecurity is the only necessary and sufficient cause of nuclear proliferation” (Thayer 1995, 486)
Soviet proliferation therefore rational because:

1. Competition with US
2. Expensive but worthwhile
3. US did not intervene
Why Not Bargain?

Bargaining works!
Declining state gives immediate concessions to rising state
Rising state does not build—pointless if it already gets what it wants
Efficient result

Proliferation puzzle
Why Not Bargain?

- Bargaining works!
  - Declining state gives immediate concessions to rising state
  - Rising state does not build—pointless if it already gets what it wants
  - Efficient result

- Proliferation puzzle
Why Soviet Proliferation?

- Commitment problem: bargaining can fail if declining state’s desire to prevent fluctuates
  - US wanted to buy off USSR
  - Concessions would disappear once US was ready to intervene
  - USSR proliferates to guarantee its position
Key Features

- Bargaining model of war framework (Fearon 1995)
- Investment endogenous, costly
- Interaction continues through time
Game Tree

Motivation
Butter-for-Bombs Model
War Exhaustion, Intelligence Problems, and Soviet Proliferation
Conclusion

Model Features
Game Tree
Outcomes
Robustness

1-xt, xt
D R
1
0 0
1
1-xt, xt
1-pR-cD,
pR-cR
1-pR-cD,
pR-cR
1-p'R-cD,
p'R-cR
Prevent
D D
Reject
Build Advance
Reject
Accept
(R pays k)
R
xtxt

1-x_t, x_t
1-x_t, x_t

0
0

Reject
Prevent
Accept
Accept

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Equilibrium Outcomes

- Preventive War Deters Proliferation

- Cost to Build

- Extent of Power Shift

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Equilibrium Outcomes

Preventive War Deters Proliferation

Concessions Not Worth Costs

Cost to Build

Extent of Power Shift
**Equilibrium Outcomes**

- **Preventive War Deters Proliferation**
- **Butter-for-Bombs**
- **Concessions Not Worth Costs**

**Motivation**
- Butter-for-Bombs Model
  - War Exhaustion, Intelligence Problems, and Soviet Proliferation

**Conclusion**
- Preventive War Deters Proliferation
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**Model Features**
- Game Tree
- Outcomes
- Robustness

**Preventive War** Deters Proliferation

**Concessions** Not Worth Costs

**Extant of Power Shift**

**Cost to Build**
Robustness

- Butter-for-bombs robust to alternative specifications
  - Non-binding agreements
  - Imperfect monitoring
  - Prior investment in nukes
  - Prestige
  - Punishment for reneging
  - Negative externalities
  - Non-binary power shifts
  - Endogenous investment costs
  - Nondeterministic proliferation
  - Bargaining over objects that influence future bargaining power
Creating a Commitment Problem

- Baseline model: D’s war cost remains static
- But sometimes ability/desire to fight wars comes and goes
- Suppose $c_D$ decreases over time
- Causes commitment problem
Equilibrium Outcomes

Preventive War Deters Proliferation

Butter-for-Bombs

Cost to Build

Extent of Power Shift

Concessions Not Worth Costs

Today
**Motivation**

**Butter-for-Bombs Model**

**War Exhaustion, Intelligence Problems, and Soviet Proliferation**

**Conclusion**

**Commitment Problem**

**Intuition**

**Soviet Union, 1949**

**Counterfactual Soviet Union, 1960**

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**Equilibrium Outcomes**

- **Preventive War Deters Proliferation**
  - Tomorrow

- **Butter-for-Bombs**
  - Today

- **Concessions Not Worth Costs**

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**Extent of Power Shift**

**Cost to Build**
Equilibrium Outcomes

Preventive War Deters Proliferation

Butter-for-Bombs

Concessions Not Worth Costs

Cost to Build

Extent of Power Shift

USSR 1949
War Exhaustion

- Post-WWII: Domestic pressures to send troops home
- Churchill loses PM before V-J
- Truman 1946 midterm election defeat
American Spies in Russia, 1945
Equilibrium Outcomes

- Preventive War Deters Proliferation
  Counterfactual USSR, 1960

- Butter-for-Bombs
  USSR, 1949

- Concessions Not Worth Costs

Extent of Power Shift

Cost to Build

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Cuban Missile Crisis, 1962
CIA (1952), Spy Planes (1955) Enter the Fray
Comparing the Counterfactual

- Suppose USSR did not proliferate by 1960
- Would US still give USSR concessions?
  - Questionable—US more willing and better prepared
Comparing the Counterfactual

- Suppose USSR did not proliferate by 1960
- Would US still give USSR concessions?
  - Questionable—US more willing and better prepared
- So is proliferating in 1949 rational?
  - Settlement possible in the short term
  - But terms would eventually go bad
  - Proliferation rational despite inefficiency
Recap

- Existing explanations *necessary* but not sufficient
- Why not bargain?
- Arms treaties fail if preventive war threat increases over time
Robustness: Prior Investment

- Other models of shifting power put the investment decision upfront. Why is this model the “right” one?
- Equilibrium outcomes with bargaining Pareto dominate equilibrium outcomes without bargaining
- Why would states “choose” the no bargaining game?
  - Rising state: “Declining state, make me an offer I can’t refuse.”
  - Declining state: “Gladly!”
Robustness: Prestige

- O’Neill 2006: States proliferate to enhance prestige
  - Many dispute this (Thayer 1995; Lavoy 1993)
- Regardless, prestige is zero sum
  - If all states are prestigious, no states are prestigious
- So “prestige” is a bargaining good
- Difference between $p_R$ and $p'_R$ implicitly covers this
Robustness: Punishment for Reneging

- Suppose *quid pro quo* bargaining, or D can recoup part of its offer if R builds
- Makes butter-for-bombs bargaining easier
- Eliminates the investment region entirely
Robustness: Negative Externalities

- Nuclear weapons impose costs on both states orthogonal to bargaining problem.
- R’s negative externalities implicitly covered in $k$.
- Negative externalities for D make D more inclined to launch preventive war and buy R’s compliance if preventive threat incredible.
Robustness: Non-Binary Power Shifts

- Model only allows R to jump from $p_R$ to $p'_R$
- What if R could choose an investment level $k$ and receive a value for $p'_R$ as a function of that $k$?
- Then some $k^*$ maximizes the tradeoff between additional power and investment costs
- Imagine that $k^*$ is the $k$ in the model and its associated $p'_R$ is the $p'_R$ in the model
- Same butter-for-bombs result holds
Robustness: Endogenous Investment Costs

- What if R could control how costly weapons are, perhaps by signing treaties to make proliferation more difficult?
- Butter-for-bombs holds
- Proliferation region completely disappears
Robustness: Endogenous Investment Costs

The Rising State's Cost Paradox

Cost of Building vs Per-Period Payoff

- D's Payoff
- R's Payoff

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Robustness: Nondeterministic Proliferation

- What if proliferation was the result of a random process?
- Makes investment more costly (since possibility of failure), making butter-for-bombs easier
- Butter-for-bombs spreads to region in which preventive war previously deterred R
  - Nondeterministic proliferation makes preventive war costlier (since sometimes it turns out to be unnecessary), rendering D’s proliferation threat incredible
Robustness: BOOTIFBP

- What if changes to the status quo today make R more likely to prevail in war?
- Fearon 1996: Bargaining remains possible
  - Receiver willing to accept smaller offers upfront knowing that larger offers must come later
  - Problems only break out if bargaining good is not continuous
- Empirical support: Egypt, Israel, and the Sinai
Robustness: Imperfect Monitoring

Equilibrium Outcomes

- Preventive War, Proliferation
- Additional Concessions
- Butter-for-Bombs
- Too Cold, No Concessions

Cost to Build vs. Extent of Power Shift

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Appendix: Nukes Defensive?

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

\[ \begin{array}{c|ccc}
 & D \text{ Victory} & \text{Stalemate} & R \text{ Victory} \\
\hline
R's \text{ Capital} & \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \\
0 & .5 & 1 \\
\end{array} \]
Appendix: Nukes Defensive?

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

<table>
<thead>
<tr>
<th></th>
<th>D Victory (1/3)</th>
<th>Stalemate (1/3)</th>
<th>R Victory (1/3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R's Capital</td>
<td>0</td>
<td>.5</td>
<td>1</td>
</tr>
<tr>
<td>D's Capital</td>
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<td>1</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Stalemate (2/3)</th>
<th>R Victory (1/3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R's Capital</td>
<td>1</td>
<td>.5</td>
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- Result: Nukes improve R’s average outcome even if never used