When Capabilities Backfire: How Improved Hassling Capabilities Can Produce Worse Outcomes

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VFT 2020

Motivation: Saddam's Gamble

- Pre-2003 U.S. Invasion Iraq
  - Saddam was lying to and turning away weapons inspectors.
  - U.S. interpreted this as Iraq building WMD & invaded.
  - But, Saddam's WMD program was essentially nonexistant.
- What was Saddam thinking?
  - Saddam had reason to keep his capabilities hidden.[1]
  - But why even try?
  - Gulf War I (1991) was incredibly one sided.
    - Coalition troops killed: 300,
      Iraqi troops killed: 20,000-26,000.[2]
  - Why did U.S. threats go unheeded?

[1] Koblentz 2018; Coe & Vaynman 2020

[2] Project on Defense Alternatives

Motivation: Saddam's Gamble

- Saddam wasn't just considering Gulf War I.
  - In Operation Desert Fox (1998), U.S. conducted a bombing campaign against Saddam's weapons facilities.
  - I call limited engagements short of war *hassling*.[3]
- Before the invasion, Saddam thought a hassling response was likely, and he was willing to gamble.
- This suggests a troubling possibility.
  - The US & allies are getting better at ops like Desert Fox.
    - Cyberwarfare, special operations, precision strikes, drones, assassinations of nuclear scientists, etc...
    - "Revolution in military affairs."
- Are more tools in the "policy-toolbox" a good thing?

[3] Schram, Forthcoming (AJPS)

Key result:

Better hassling capabilities $\rightarrow$ Worse outcomes.

(sometimes)

(when private and public capabilities interact and provoke problematic strategic responses)

Setup: like Fearon 1997 & Gurantz & Hirsch 2017

- Two actors: Challenger (C) and Defender (D)
- Challenger selects some transgression level $t \geq 0$.
  - Transgressions improve challenger's final payoffs.
  - Ex. Saddam turning away weapons inspectors.
- Defender observes t, and goes to war or hassles $h \geq 0$.
  - War decisively halts the transgression.
  - Hassling undercuts t, is selected from a continuum.

Setup: like Fearon 1997 & Gurantz & Hirsch 2017

- Challenger selects some transgression level $t \geq 0$.
  Defender observes t, and goes to war or hassles $h \geq 0$.
  If war isn't selected, some bargaining protocol happens.
- What's new? D's hassling capabilities have public (parameter α) and private (type θ) components.
  - Public parameter = previously demonstrated hassling,
    Private type = secret hassling capabilities.
- **Strategic Dynamic**: C wants to aggressively transgress, but may be deterred by capable hassling or war.
- **Key Question**: Can improvements in D's capabilities give D overall (i.e. for all types) weakly lower utilities?
  - I call this a "capability failure."

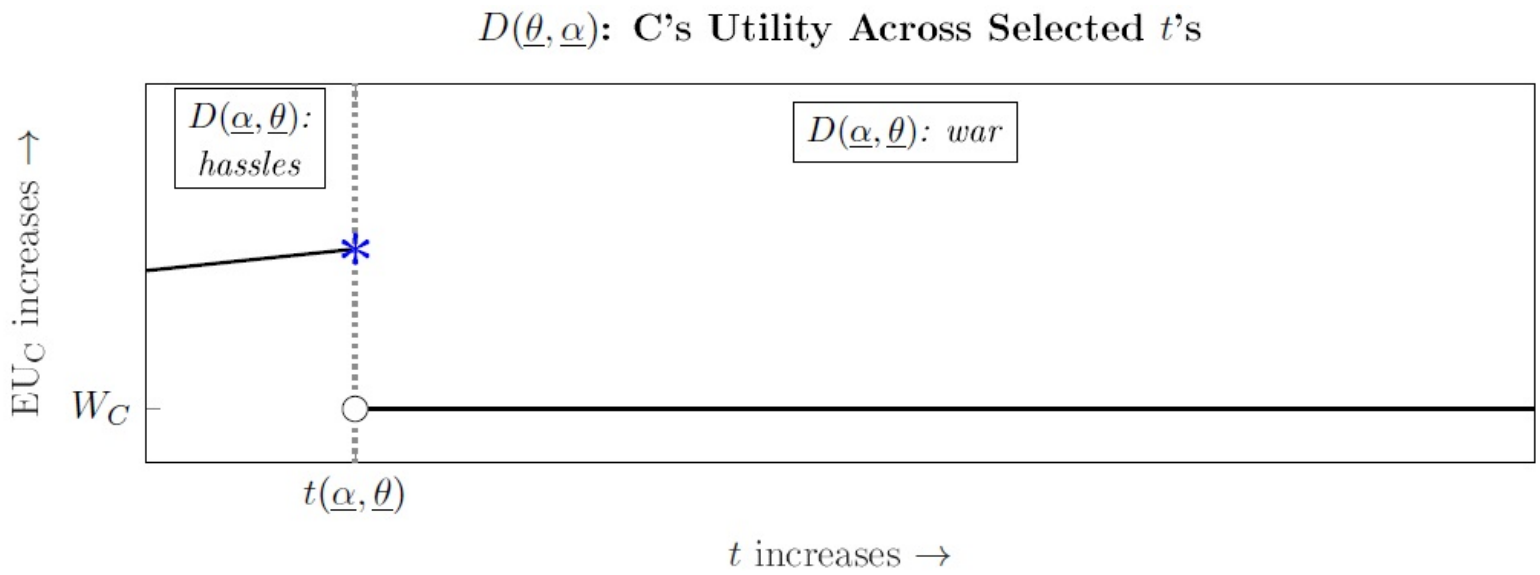
The Model: Overview

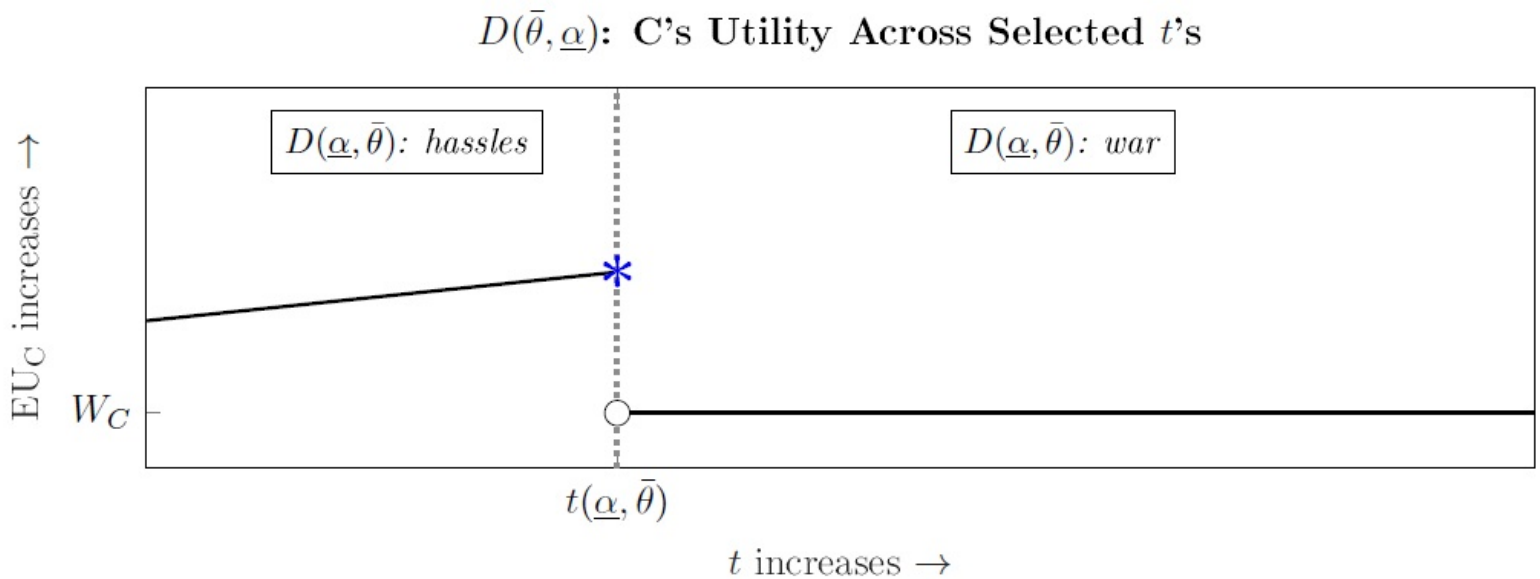
- Game form for a given $\alpha \in \{\underline{\alpha}, \bar{\alpha}\}$ with $\underline{\alpha} < \bar{\alpha}$.
  1. Nature designates D's type $\theta \in \{\underline{\theta}, \bar{\theta}\}$ with $\underline{\theta} < \bar{\theta}$.
  2. C transgresses $t \geq 0$.
  3. D can go to war, or hassle $h \geq 0$.
  4. Utilities realized (black-boxed bargaining).
- When D goes to war:
  - $U_D = W_D$, $U_C = W_C$.
- When D hassles:
  - $U_D = X_D - t + h - \frac{h^2}{F(\alpha,\theta)}$, $U_C = X_C + t - h$.
  - F is increasing in α and θ.
- If C's t is too high, $X_D - t + h^* - \frac{(h^*)^2}{F(\alpha,\theta)} < W_D \rightarrow War$
  - C dislikes war, or $X_C > W_C$.

Model Intuition: Complete Information

- Proof by picture.
- On C's utility:
  - C dislikes war.
  - C likes bigger transgressions (no costs).
  - C is willing to tolerate hassling (also no costs).
- Question: For a fixed $\underline{\alpha}$, how does this play out in a complete information model when θ is observed by C?
- Answer: C selects transgression calibrated to make both types D indifferent between war and hassling.

Full Info: C makes D indifferent btw hassling and war





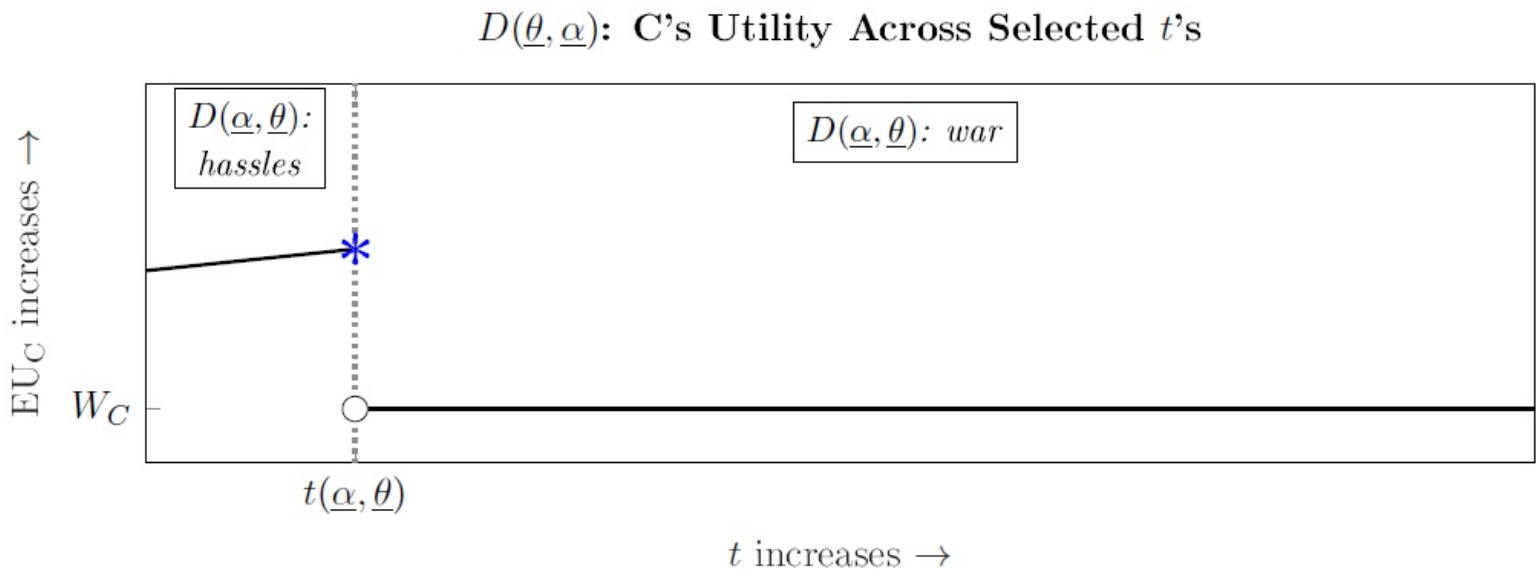
Model Intuition: Complete Information

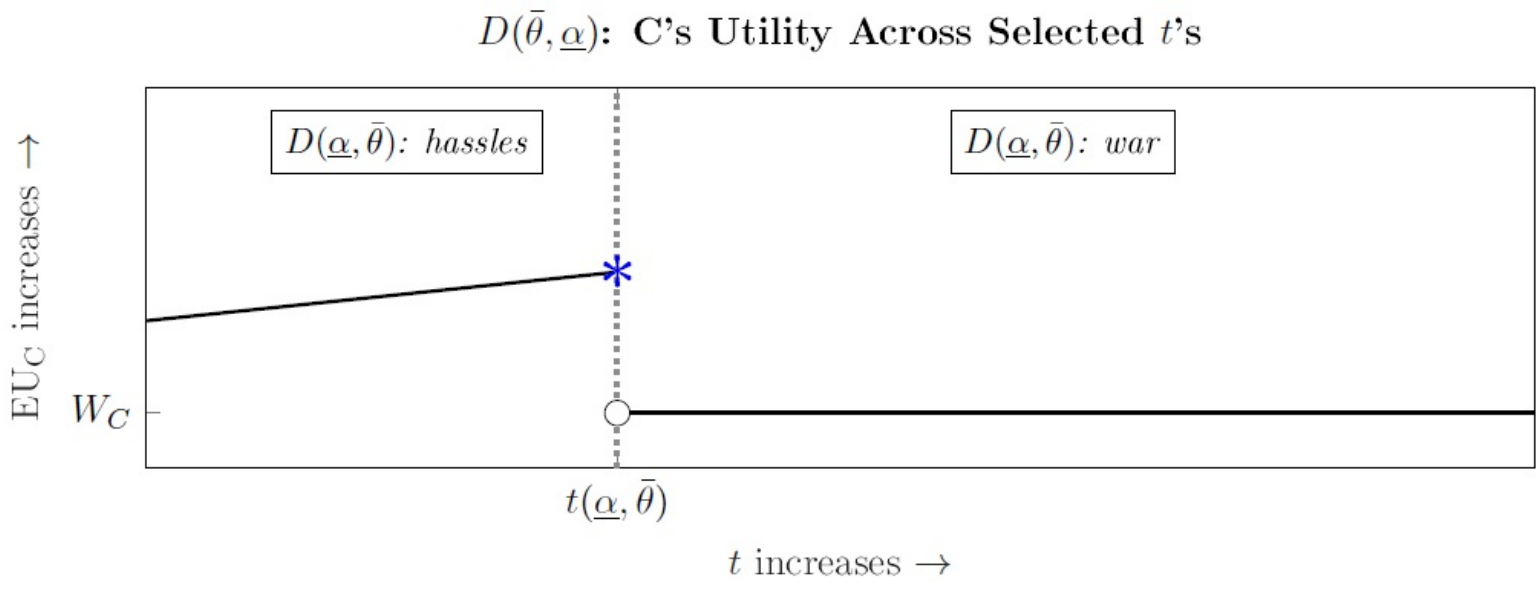
- Question: With complete information, can improvements in α ever produce a "capabilities failure" (i.e. each type θ attaining a lower utility)?
- Answer: No! With complete information, C makes all types of D indifferent between hassling and war, so all D's get their war utilities!

Model Intuition: Incomplete Information

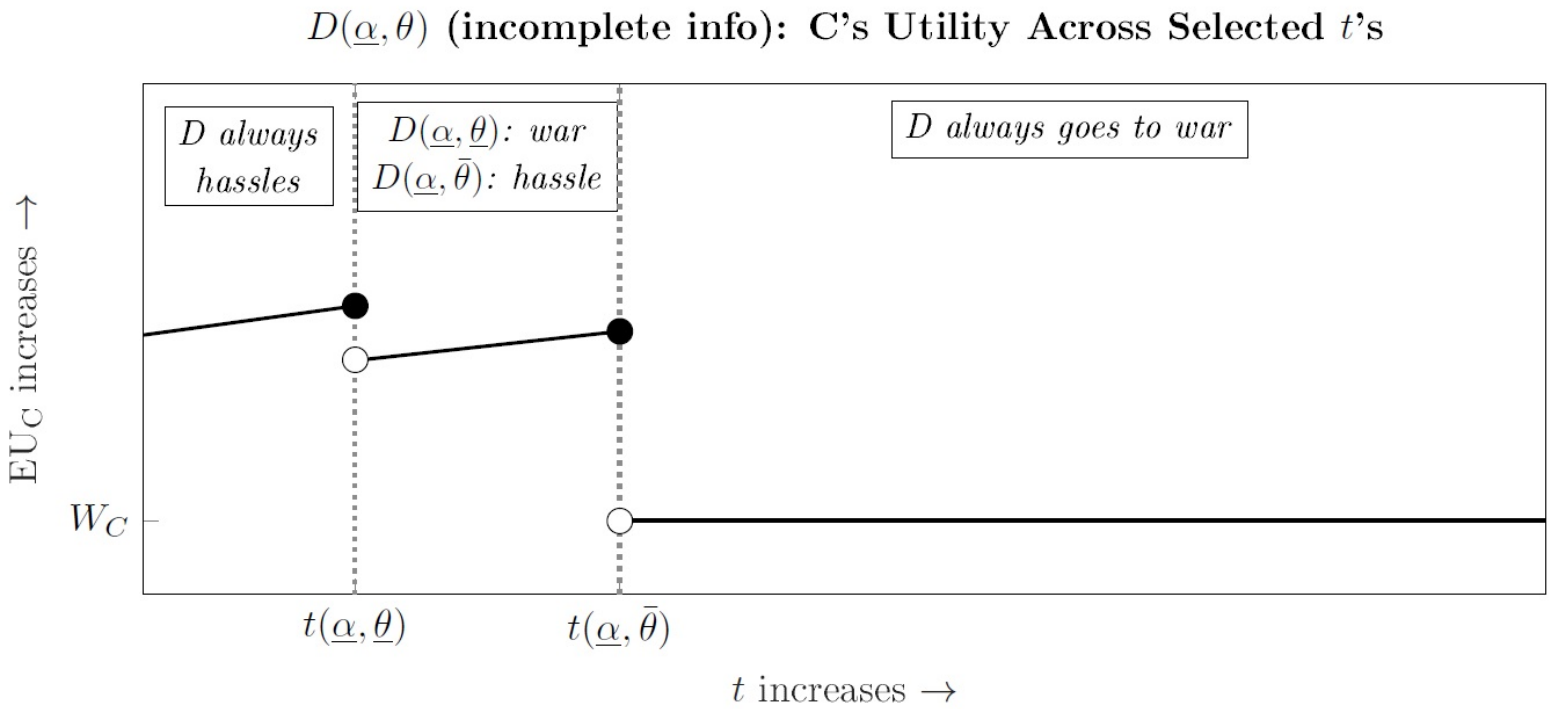
- W/ complete information, C could always invest to the point where D was indifferent between hassling and war.
- W/ incomplete information, C doesn't know if D is $\underline{\theta}$ or $\bar{\theta}$
- Thus, w/ incomplete information, C faces a tradeoff:
- C can avoid war altogether—selects smaller $t(\alpha, \underline{\theta})$.
- Or, C can risk war sometimes—selects larger $t(\alpha, \bar{\theta})$.
  - C goes to war with type $\underline{\theta}$ (bad),
  - C's has a bolder transgression against $D(\bar{\theta})$ (good).

This was under complete information

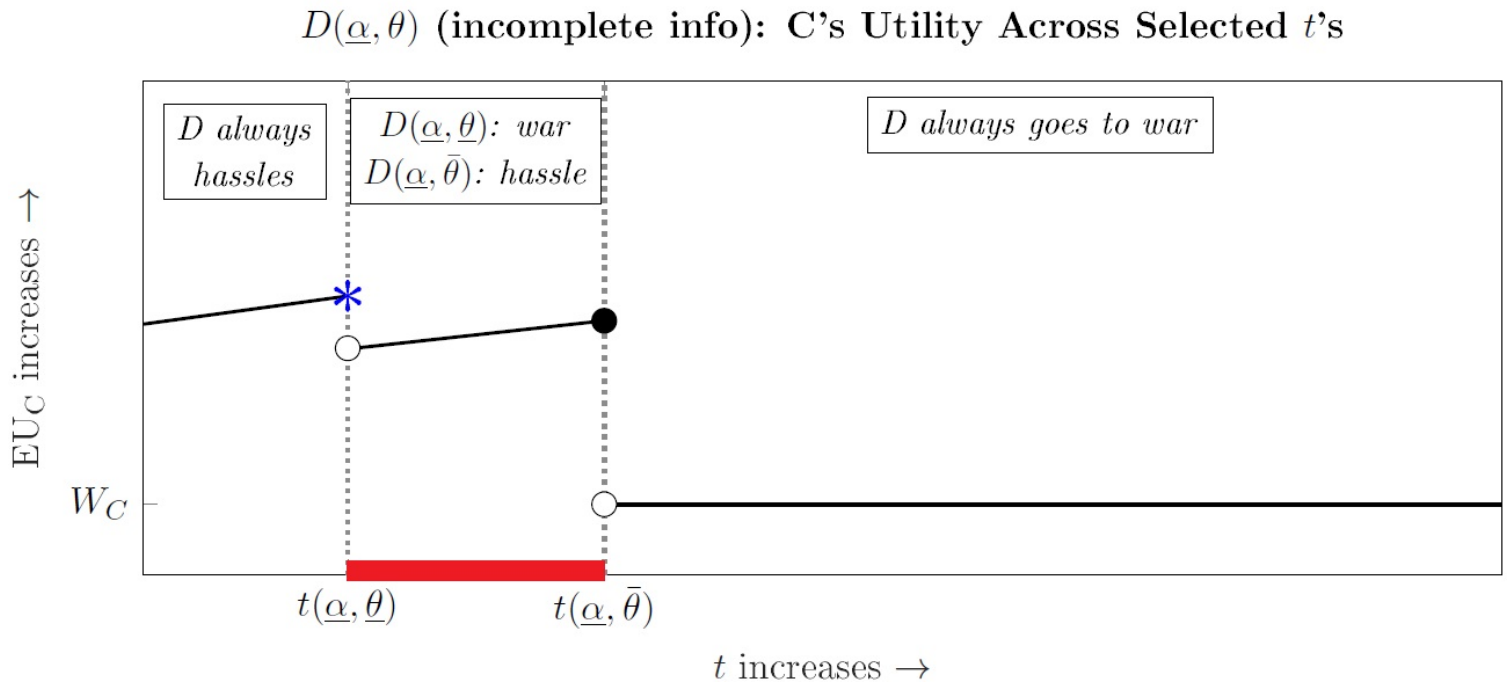




C's Decision Under Incomplete Information



C's Decision Under Incomplete Information



Red has two meanings:

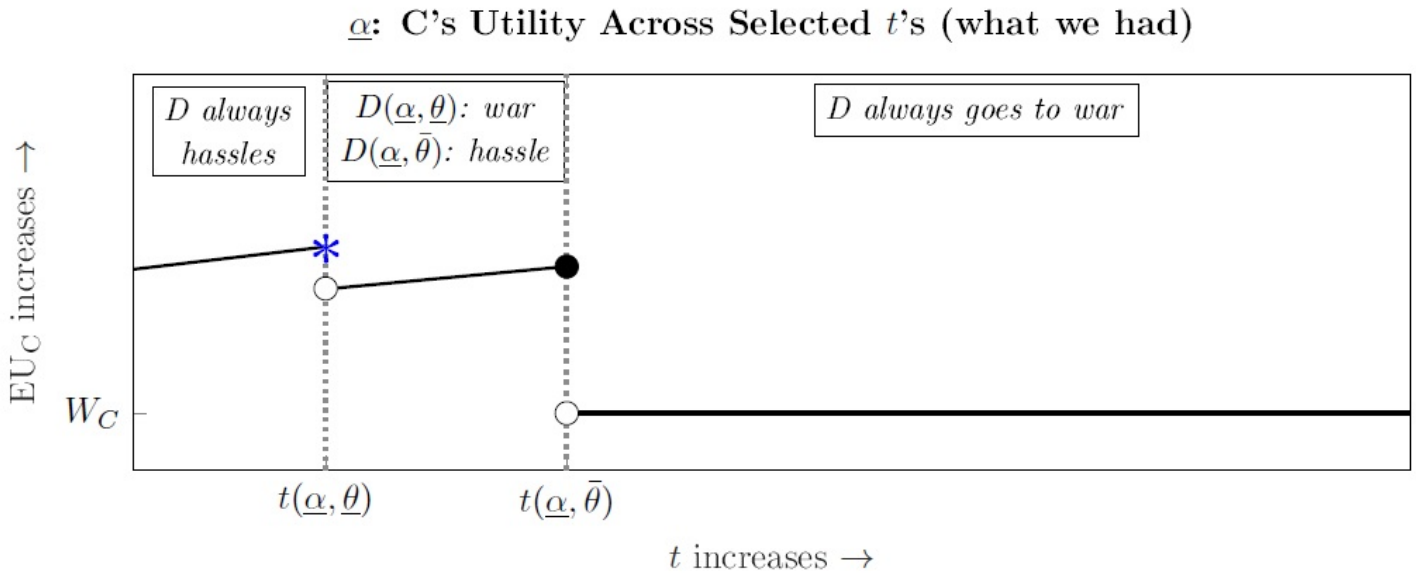
C's forgone $\triangle t$ against $D(\underline{\alpha}, \bar{\theta})$ by not risking war with $D(\underline{\alpha}, \underline{\theta})$,

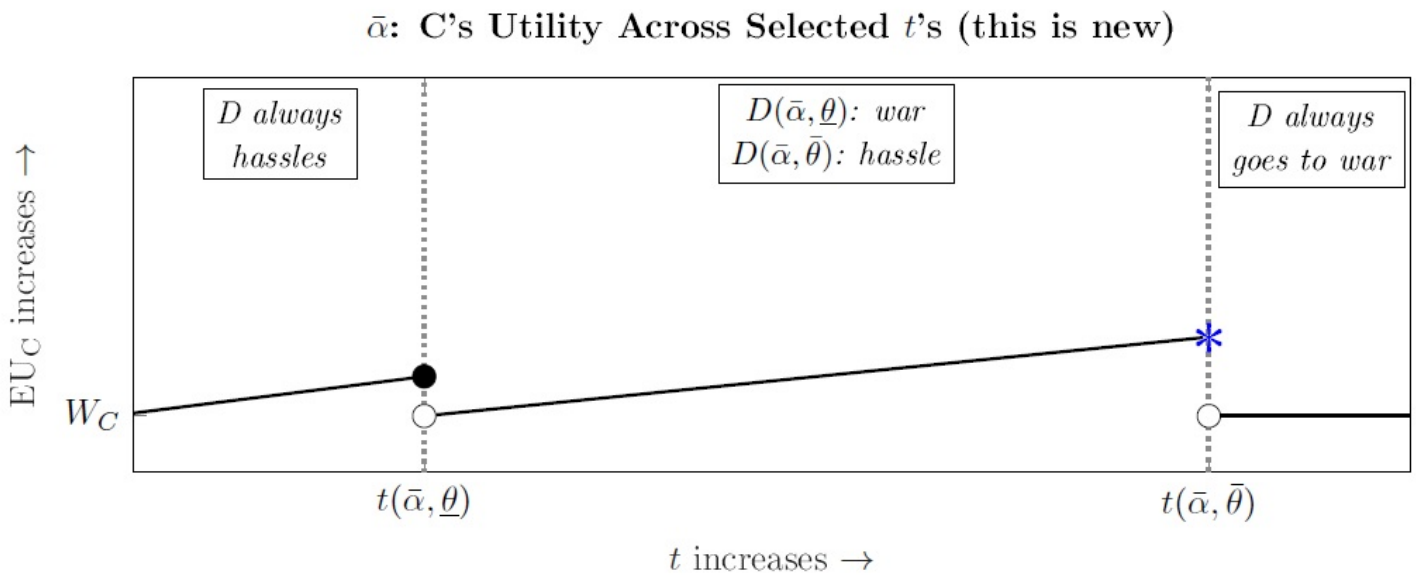
$D(\underline{\alpha}, \bar{\theta})$'s benefit to private information.

One Way D Can Do Worse With Better Capabilities

- Earlier C didn't risk war because there wasn't much upside.
- What if an improvement in public capabilities ($\underline{\alpha} \rightarrow \bar{\alpha}$) created a greater upside to risking war?

One Way D Can Do Worse With Better Capabilities





How D Does Worse With Better Capabilities

- The above was "emboldening."
  - When $\underline{\alpha} \to \bar{\alpha}$, $\underline{\theta}$ and $\bar{\theta}$ D have big differences over their hassling abilities and willingness to hassle.
  - This may encourage C to risk war.
  - U.S. hassling capabilities possibly emboldened Saddam.
- Also in the paper is D becoming more "predictable."
  - When $\underline{\alpha} \to \bar{\alpha}$, $\underline{\theta}$ and $\bar{\theta}$ D may have smaller differences over their hassling abilities.
  - The shift allows C to perform aggressive, calibrated transgressions with no risk of war.
  - The shift in α then diminishes D's information rents.

How Else Can Capability Failures Occur?

- When $\underline{\alpha} \to \bar{\alpha}$ happens, outside of "emboldening" and "predictability," capability failures cannot occur.
- When improvements in *private* capabilities $\underline{\theta} \to \bar{\theta}$ happens, capability failures cannot occur.
- When D becomes better at war, capability failures cannot occur.

Conclusion: Bigger Picture

- Better capabilities—when they improve low-level conflict capabilities—can lead to overall worse outcomes.
- See the paper for a more complete discussion on when this happens and does not happen.
- Most surprising: this isn't just that better low-level tools lead to more low-level conflict; it can actually lead to more war (Iraq 2003).
- Overall: there's something to "speak softly and carry a big stick," not "carry lots of sticks, big and small, a stick for every occasion."

End

***Definition**: Improvements in publicly observed hassling capabilities (i.e. moving from $\underline{\alpha}$ to $\bar{\alpha}$ with $\underline{\alpha} < \bar{\alpha}$) produce a **capability failure** when, $U_D\left(\sigma^*(\theta, \underline{\alpha})\right) \geq U_D\left(\sigma^*(\theta, \bar{\alpha})\right)$ for all $\theta \in \Theta$ and $U_D\left(\sigma^*(\theta, \underline{\alpha})\right) > U_D\left(\sigma^*(\theta, \bar{\alpha})\right)$ for some $\theta \in \Theta$.*

$$Q(\alpha) = Pr(\underline{\theta})\left(\kappa_C + \kappa_D\right) + \left(Pr(\bar{\theta}) - Pr(\underline{\theta})\right)\frac{F(\alpha,\underline{\theta})}{4} - Pr(\bar{\theta})\frac{F(\alpha,\bar{\theta})}{4}$$

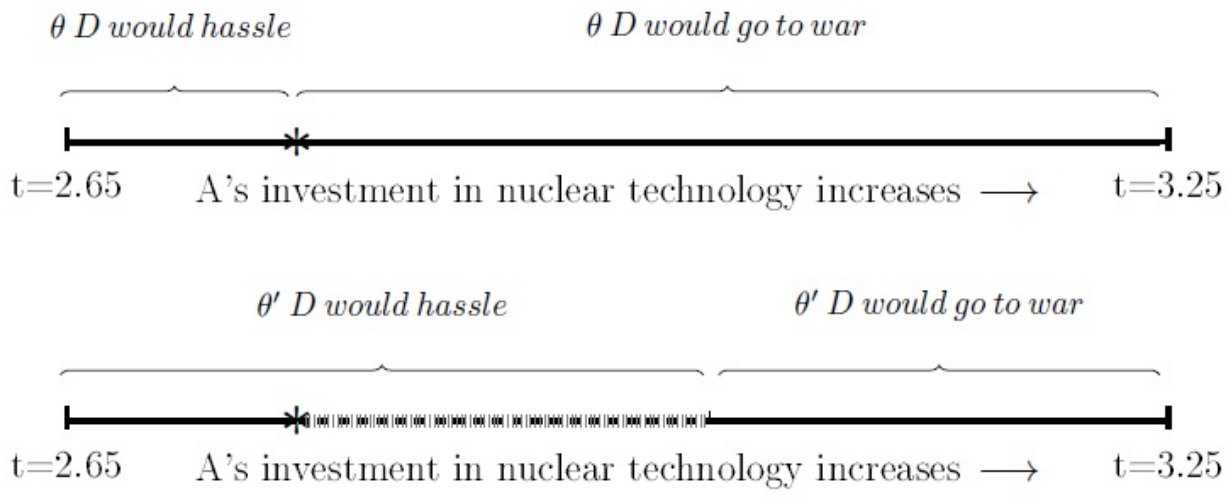
Proposition 2 (Predictability): *Under the Predictability Conditions, C avoids war across parameters* $\underline{\alpha}$ *and* $\bar{\alpha}$*; formally,* $Q(\underline{\alpha}) \geq 0$ *(Condition 1) and* $Q(\bar{\alpha}) \geq 0$ *(Condition 2). Additionally, D's private information plays a diminished role under parameter* $\bar{\alpha}$ *relative to parameter* $\underline{\alpha}$*; formally,* $(F(\underline{\alpha}, \bar{\theta}) - F(\underline{\alpha}, \underline{\theta}) > F(\bar{\alpha}, \bar{\theta}) - F(\bar{\alpha}, \underline{\theta})$ *(Condition 3). When these Predictability Conditions hold, then improvements from* $\underline{\alpha}$ *to* $\bar{\alpha}$ *produce a capability failure.*

$$Q(\alpha) = Pr(\underline{\theta})\left(\kappa_C + \kappa_D\right) + \left(Pr(\bar{\theta}) - Pr(\underline{\theta})\right)\frac{F(\alpha,\underline{\theta})}{4} - Pr(\bar{\theta})\frac{F(\alpha,\bar{\theta})}{4}$$

Proposition 3 (Emboldening): *Under the Emboldening Conditions, C avoids war under parameter* $\underline{\alpha}$ *and goes to war under parameter* $\bar{\alpha}$*; formally,* $Q(\underline{\alpha}) \geq 0$ *(Condition 1) and* $Q(\bar{\alpha}) < 0$ *(Condition 2). When these conditions hold, then improvements from* $\underline{\alpha}$ *to* $\bar{\alpha}$ *produce a capability failure.*

$$Q(\alpha) = Pr(\underline{\theta})\left(\kappa_C + \kappa_D\right) + \left(Pr(\bar{\theta}) - Pr(\underline{\theta})\right)\frac{F(\alpha,\underline{\theta})}{4} - Pr(\bar{\theta})\frac{F(\alpha,\bar{\theta})}{4}$$

For α



For α'

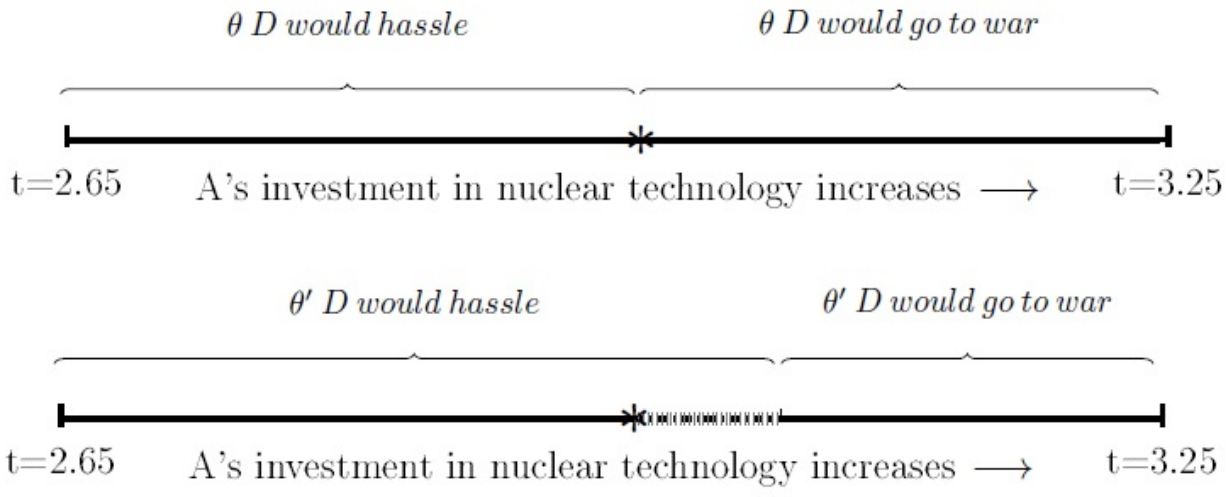


Figure 3: Optimally selected rising technology levels across α and α'.