Preference Signaling with Multiple Agents

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Information environment: An observer receives signal $\sigma_i(a)$

- *Actions* observable: $\sigma_i(a) = a_i$
- *Outcome* observable: $\sigma_i(a) = w(a)$
- *Another agent's action & outcome (Peer monitoring)*: $\sigma_i(a) = (w(a), a_j)$

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Each agent chooses a_i to maximize expectation of

$$U_i(a, \theta_i) = \theta_i w(a) - k a_i + E[\theta_i | \sigma_i(a)],$$

given her type $\theta_i \sim F$ and beliefs about behavior of other agents.

Agent acts if expected net benefit is positive

With monotonic beliefs, characterized by cutoff θ^c, this means:

$$EU_i(1, \theta_i, \theta^c) - EU_i(0, \theta_i, \theta^c) = B(\theta^c) - [k - \theta_i W(\theta^c)] \geq 0$$

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$W(\theta^c)$: expected impact on the outcome, given θ^c Graphs

- Complementarity: $(1 - F(\theta^c))^{n-1} w$
- Substitutability: $F(\theta^c)^{n-1} w$

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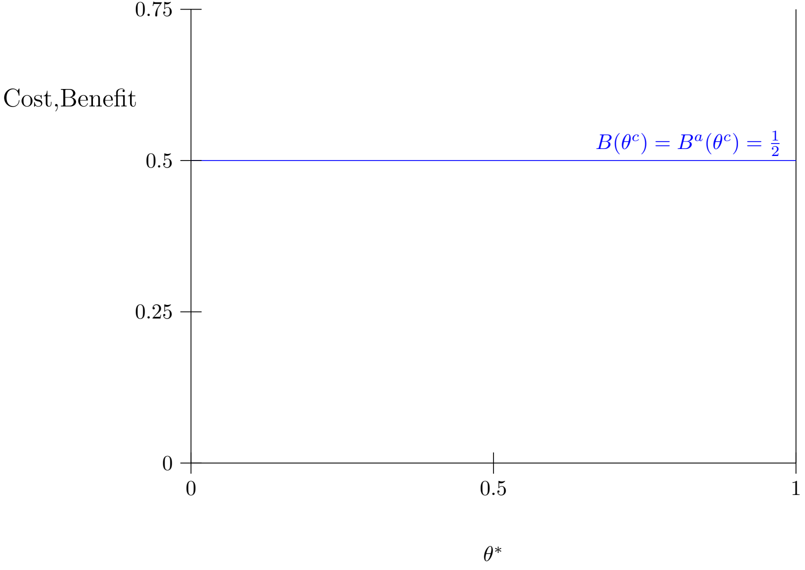
$B(\theta^c)$: expected image-benefit of taking the action, given θ^c.

- Depends on information environment
- *Actions* observable:

$$B(\theta^c) = B^a(\theta^c) \equiv E[\theta | a = 1, \theta^c] - E[\theta | a = 0, \theta^c]$$

Observable Actions: baseline info environment for $B(\theta^c)$

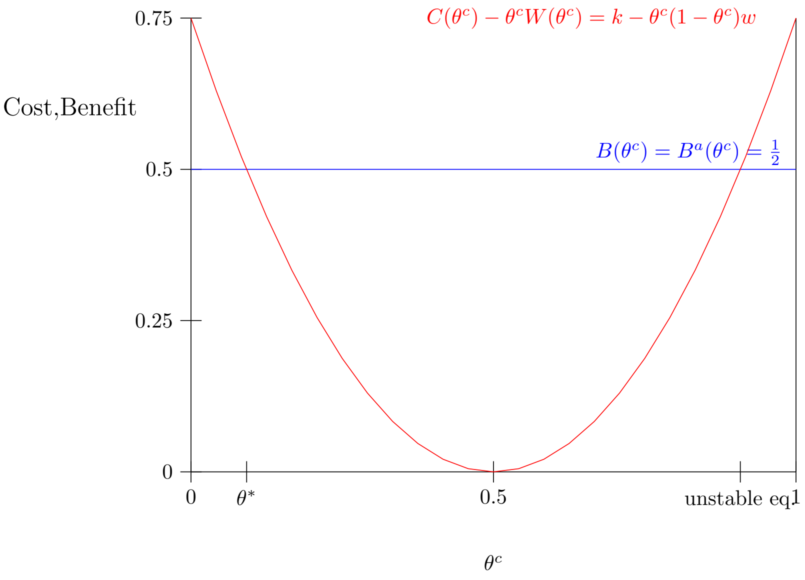


In equilibrium, cutoff type is indifferent

$$k - \theta^* W(\theta^*) = B(\theta^*)$$

Image benefit from observable *Actions* $\Rightarrow$ agents more motivated to act than w/ no signaling

Interior eq. under Comp. with *Actions* observed



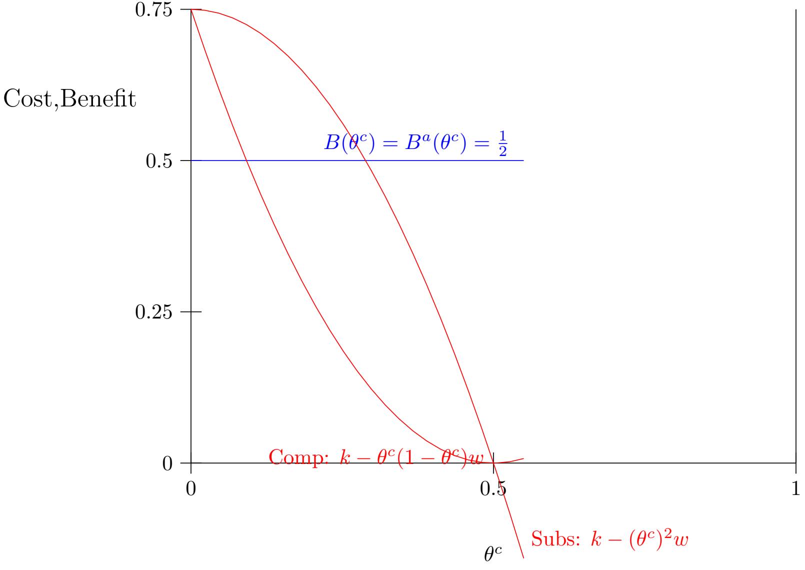
Q1: When is the motivational effect of perfect monitoring the greatest?

When material costs are relatively:

Low then effect is greater under complementarity: cutoff type cares little in either case, but more likely to affect outcome under complementarity

High then this is reversed: cutoff type cares a lot in either case, but more likely to affect outcome under subs.

Outcome technology affects cost curve, equilibrium



Q2: When are transparency rules or investment in monitoring particularly worthwhile?

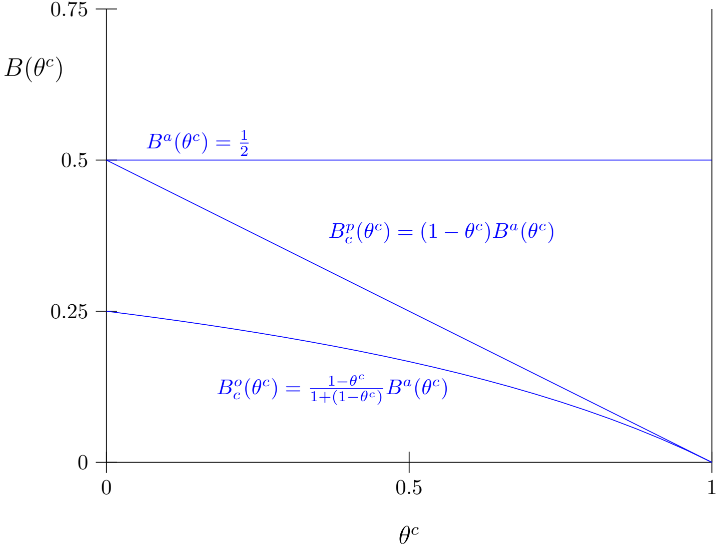
Image benefit if only *Outcome* observed:

- Complementarity: $B_c^o(\theta^c) = \frac{F(\theta^c)(1-F(\theta^c))^{n-1}}{1-(1-F(\theta^c))^n} B^a(\theta^c)$
- Substitutability: $B_s^o(\theta^c) = \frac{(1-F(\theta^c))F(\theta^c)^{n-1}}{1-F(\theta^*)^n} B^a(\theta^c)$

1. When n is large: low probability affecting outcome/signal
2. For small n, when agents are unlikely to be able to affect outcome/signal
   - Hard/uncommon tasks under complementarity
   - Easy/common tasks under substitutability

If only *Outcome* observed, technology also affects $B(\theta^c)$

Complementarity:



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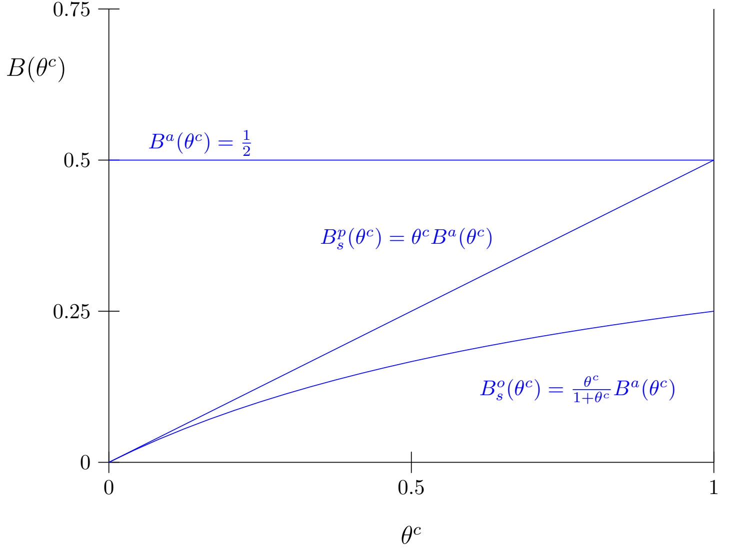
Substitutability:



Q3: When is *Peer monitoring* a good substitute for perfect monitoring?

Image benefit ($n = 2$):

- Complementarity: $B_c^p(\theta^c) = (1 - F(\theta^c))B^a(\theta^c)$
- Substitutability: $B_s^p(\theta^c) = F(\theta^c)B^a(\theta^c)$

When the information that peers have is likely to be a good complement for the info contained in the outcome.

Many interesting questions remain:

- Impact of signaling behavior in markets for goods that carry social judgments?
- When the cost is tied to the *Outcome*, differing predictions regarding *Actions* vs. *Outcomes* being observable may yield a way to distinguish self-signaling from social-signaling

Many interesting questions remain:

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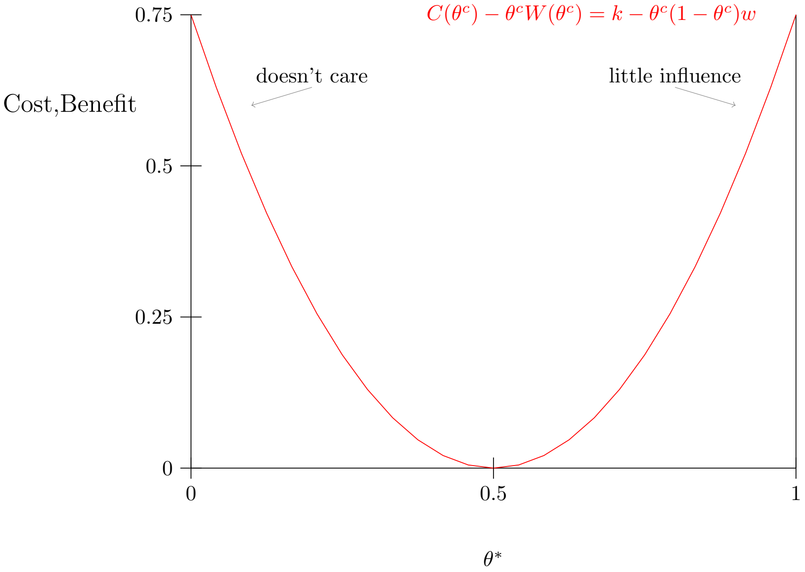
Thank you for your feedback!

Comp $\Rightarrow$ expected material cost of cutoff type is U-shaped

Example w/ $\theta \sim U[0,1]$, $n = 2$, $k = 0.75$, $w = 3$



Subs $\Rightarrow$ expected material cost of cutoff type is decreasing

as concern for and likelihood of effecting outcome increase Back