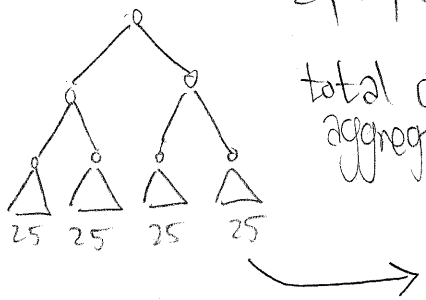
Schedule changes

Tuesday, April 29: No class
Thursday, May 1: recitation
Friday, May 2: class
May 9: class

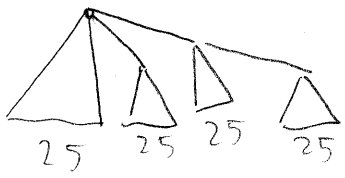
Exam: May 15

Contract theory is about incentives, moral hazard, and adverse selectic
Communication is also important. Costly communication?

Radner (1993):
- team-theoretic perspective (no incentive problems)
- looking at one project costs 1 (from scratch)
- learning about one project from a team member costs $\alpha \leq 1$.
- concern for delay implies team work
- 1 person: 100 periods to find best (of 100 projects)
- 2 people: $50+\alpha$ periods



total delay: $25+2\alpha+2\alpha = 25+4\alpha$
aggregate time: $100+6\alpha$

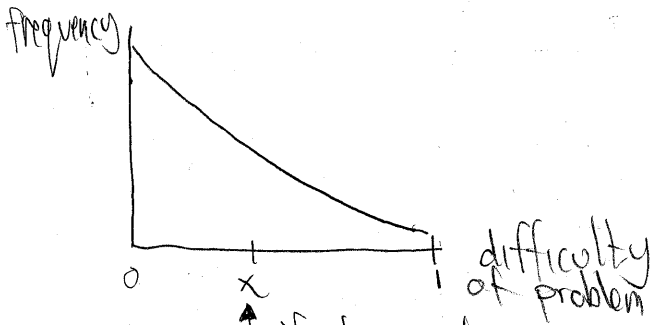


α
$+$
α
$+25$
$25+2\alpha$ - total delay
aggregate time $= 100+3\alpha$

- bit of an operations research problem

Dewatripont-Bolton: returns to specialization, higher frequency makes people more efficient. Assume costs become $\alpha+\beta n$, where n is the number of projects being described.

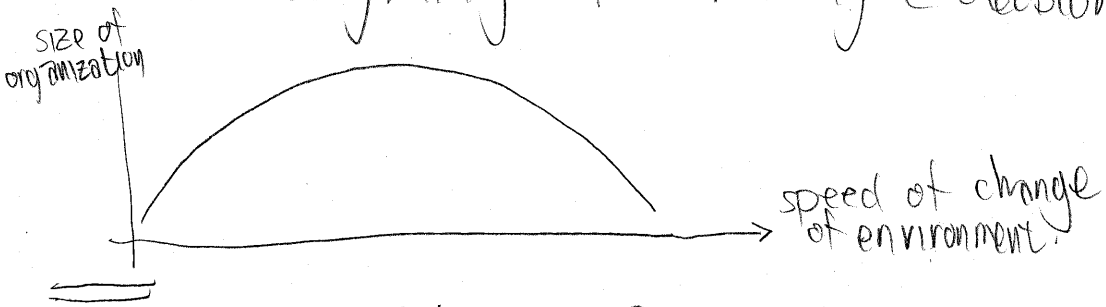
Garicano: solving problems requires training



↳ if trained up to x, can solve problems with difficulty $\leq x$.

If everyone works alone, need to have $x=1$ for everyone
If have specialists and generalists, most will have x small some will have $x=1$. Problems are sent first to small x people. If cannot be solved, send to higher x people. This economizes on $\psi(x)$, training costs

- Might be the case that we don't necessarily want to know everything before making a decision.



Dessein, Santos - Adaptive Organizations

- Primary action a: ideally as close as possible to parameter $\theta \sim (\theta_0, \sigma_\theta^2)$.
- complementary action b as close as possible to a

Goal: $\min E[\underbrace{\psi(a-\theta)^2}_{\text{cost of misadaptation}} + \underbrace{\beta(b-a)^2}_{\text{cost of "miscoordination"}}]$

- product design. Want it to fit market dmd
- choice of input needs to fit design.

Decentralized organization: S ("sender") - in charge of primary action

- S observes θ, chooses a
- R (receiver) chooses b w/o observing θ or a directly

- R gets a message from S w/ prob p
  - gets nothing w/ prob 1-p.
- will at some point endogenize p.

S: $\min_a \varphi(a-\theta)^2 + \beta(1-p)(\theta_0-a)^2$, since w/prob 1-p, B will choose expectation

$$\Rightarrow a = \theta_0 + \underbrace{\frac{\varphi}{\varphi+\beta(1-p)}}_{\text{degree of adaptiveness}}(\theta-\theta_0) = \frac{\beta(1-p)}{\varphi+\beta(1-p)}\theta_0 + \frac{\varphi}{\varphi+\beta(1-p)}\theta$$

cost to organization: $\frac{\varphi\beta(1-p)}{\varphi+\beta(1-p)}\sigma_\theta^2$

- increasing in σ_θ^2 and costs φ, β.

Assume $p \in \{p_L=0, p_M>0\}$ with cost K to have $p_M>0$.

$$\min_{p\in\{0,p_M\}} \frac{\varphi\beta(1-p)}{\varphi+\beta(1-p)}\sigma_\theta^2 - K\mathbb{1}_{\{p=p_M\}}$$

- more communication $\Leftrightarrow$ more adaptive

These all bring in exogenous reasons for people to work together. They then ask "how do they work together?"

Results:

(i) adaptiveness and communication/centralization are complementary: $p\uparrow \Rightarrow$ adaptiveness $\uparrow$.

(ii) $\sigma_\theta^2\uparrow$ or $\varphi\uparrow \Rightarrow$ more adaptation and more communication

(iii) $\beta\uparrow$ has ambiguous effects (it is not true what Becker and Murphy said.)
- if β extremely high, just set $a=\theta_0$.

(*) Read Dessein-Santos, also Alonso, Dessein, Matouschek

What happens to incentive problems if communication is costly? Dewatripont-Tirole

"Executive Decisionmaking"

- only hard information can help (in fact, the devil is in the details!)
- stage 0: S and R each decide to spend effort $\frac{K}{2}$ to "be able to communicate." If both spend $\frac{K}{2}$, get $p = p_M$ instead of $p = 0$.
- $U_S = -sE[\varphi(a-\theta)^2 + \beta(b-a)^2]$
- $U_R = -rE[\varphi(a-\theta)^2 + \beta(b-a)^2]$

Then there exists an equilibrium with communication if K low enough and $\min\{s, r\}$ is high enough

"Supervisory Decisionmaking": not only hard information can help

- $U_S = -sE[\varphi(a-\theta)^2 + \beta(b-a)^2]$
- $U_R = -r[\alpha E[|b-a|] + (1-\alpha)E[|b-\theta_0|]]$

(α: w/prob α, receiver cares only about coordination or has a future w/sender; $1-\alpha$: w/prob $1-\alpha$, receiver cares only about being close to market average.)

If $\alpha < \frac{1}{2}$, cheap talk will not move the receiver.
If $\alpha > \frac{1}{2}$, end up having costly communication replaced with cheap talk ("real authority").