Biased Performance Evaluation in a Model of Career Concerns: Incentives vs. Ex-Post Efficiency

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Motivation

- Traditional career concerns framework:
  - Agent's performance depends both on effort and ability
  - Principal observes performance *directly* and forms belief about ability
  - Expected ability $\longrightarrow$ future wage/promotion/retention/reelection $\longrightarrow$ incentive to exert effort
- In reality, principal often receives information *from intermediary (evaluator)*
- *Evaluator's objective may differ* from the one of Principal

Motivation. Real-life settings

- Peer evaluation in organizations
- Evaluation of a governmental program by an ad hoc committee
- Evaluation of CEO by the board/board committee
- Evaluation of elected politicians by media

Main message

- Though bias leads to ex-post inefficient decisions regarding the Agent (promotion/replacement/termination...)...
- ... it can **incetivize the agent ex-ante**
- **Ex-ante optimal bias solves this trade-off** – framework to analyze effects of bias

Specific results

- **Optimal bias can be anti-Agent and pro-Agent**
  - Depends on the value of unfavorable decision relative to favorable decision
- **Strength of career concerns increases optimal bias**
- **Ex-ante uncertainty about agent's ability reduces optimal bias**
- Communication vs. delegation: **delegation can be better when bias is large**
- Application of model to peer evaluation and promotion in organizations

Relation to literature

- Career concerns (Holmström, 1999; Gibbons and Murphy, 1992; ...). I introduce intermediary with biased objectives
- Large principal-agent literature, e.g.,
  - Models with objective *contractible* performance measures (Holmström, 1979; Feltham-Xie, 1994; Baker, 2002; ...)
  - Subjective performance evaluation models (Prendergast and Topel, 1996; Sol, 2010,...)
- In this literature (with few exceptions), it is better to have less distortions in performance measures:
  - More efficient contracts (easier to provide incentives)
  - Fewer mistakes in job allocation/promotion
- In my setup neither performance nor evaluator's report will be contractible – biased evaluation helps in the presence of contractual imperfections

Relation to literature

- Dewatripont, Jewitt, and Tirole (REStud1999)
  - notice that garbling of a performance measure in a career concerns setup may result in a higher agent's effort
  - however, focus on negative effect of info garbling on incentives (deficiency of creating "fuzzy missions" for an agent)
- Crémer (QJE1995)
  - setup with explicit incentives
  - it can be optimal for the principal to commit to stay uninformed about the causes of poor agent's performance $\Rightarrow$ commitment not to renegotiate with the agent $\Rightarrow$ stronger incentives.
- Neither of these papers study intermediated evaluation or optimal promotion policies, which are the focus of my work.

Model. Players

- Players: Principal (P), Evaluator (E), Agent (A)
- A's ability $\theta \sim F(\cdot)$
- θ – unknown to anyone, $\mathbf{E}\theta \equiv t$, $F(\cdot)$ – common knowledge
- Density $f(\cdot)$: full support, differentiable everywhere, unimodal

Model. Timing

Period 1

- A exerts effort e, cost $c(e),\ c'(0) = 0,\ c'(\cdot) > 0\ \forall e > 0,\ c''(\cdot) > 0\ \forall e$
- A's performance $y(\theta, e) = \theta + e$ realized.
- E (but not P) observes y and makes report $r \in \mathbb{R}$ to P.
- P takes a *binary* decision regarding A: "favorable" or "unfavorable"
- Organization's 1st period output realized: $\Pi_1 = y$

Period 2

- output $\Pi_2 = \begin{cases} \alpha\theta \text{ if favorable decision} \\ z \text{ if unfavorable decision} \end{cases}$

Model. Payoffs of Principal and Agent

Principal

- P's payoff: Π_i in each period
- P's ex-ante welfare: $W = \mathbf{E}\Pi_1 + \delta \mathbf{E}\Pi_2$

Agent

- A's payoff in period 1: $-c(e)$
- A's payoff in period 2: $\begin{cases} B \text{ if favorable decision} \\ 0 \text{ if unfavorable decision} \end{cases}$
- A's ex-ante welfare: $-c(e) + \delta_A B \cdot I(\textit{favorable decision})$

Model. Payoff of Evaluator (compared to Principal)

Principal in period 2

- $\Pi_2 = \begin{cases} \alpha\theta \text{ if favorable decision} \\ z \text{ if unfavorable decision} \end{cases}$

Evaluator in period 2 (ignore period 1)

- $\begin{cases} \alpha\theta \text{ if } P\text{'s decision was favorable} \\ z + b \text{ if } P\text{'s decision was unfavorable} \end{cases}$

Bias:

- $b > 0$ – anti-Agent
- $b < 0$ – pro-Agent

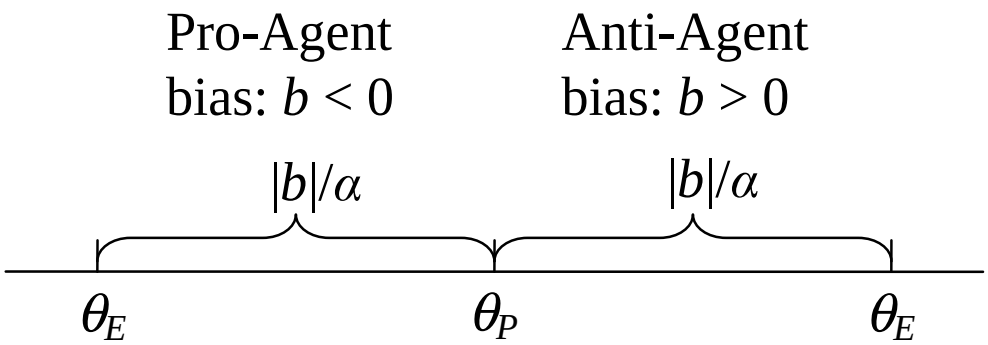
P's and E's ideal policy thresholds

- *P*'s *ideal* policy: favorable decision iff

$$\theta \geq \frac{z}{\alpha} \equiv \theta_P$$

- *E*'s *ideal* policy: favorable decision iff

$$\theta \geq \frac{z+b}{\alpha} \equiv \theta_E = \theta_P + \frac{b}{\alpha}$$



Solution. Communication and P's decision

- For given E's belief $\widehat{e}$, E infers $\widehat{\theta} = y - \widehat{e}$ and makes report r
- Given E's message r, P will take favorable decision iff

$$\mathbf{E}(\theta \mid r) \geq \theta_P$$

Lemma

- When $b \in [b_{\min},\ b_{\max})$, decision-relevant communication:
  - E reports whether $\widehat{\theta} < \theta_E$ or $\widehat{\theta} \geq \theta_E$
  - P "follows E's advice", i.e., takes unfavorable decision after negative report and favorable one – after positive report
- When $b \notin [b_{\min},\ b_{\max})$, no decision-relevant communication
- Note: $b_{\min} < 0$

Solution. Choice of effort

- If $b \notin [b_{\min},\ b_{\max})$, no effort
- Let $b \in [b_{\min},\ b_{\max})$ Agent maximizes *expected* benefit from favorable decision net of effort cost

$$y_E(\widehat{e}) \equiv \theta_E + \widehat{e}$$

$$\Pr[\theta + e \geq y_E(\widehat{e})] = \Pr[\theta \geq y_E(\widehat{e}) - e] = 1 - F(y_E(\widehat{e}) - e)$$

$$\max_e \delta_A \left[1 - F(y_E(\widehat{e}) - e)\right] B - c(e)$$

$$\delta_A B f(y_E(\widehat{e}) - e) = c'(e)$$

- In equilibrium $e = \widehat{e} = e^*$, hence

$$\delta_A B f(\theta_E) = c'(e^*)$$

Effort maximizing bias

$$\delta_A Bf(\theta_E) = c'(e^*)$$

- Effort-maximizing $\theta_E \equiv \theta_{inc} = mode$ of $F(\cdot)$
- Intuition: marginal effect on probability of passing threshold is highest at the mode

$$\theta_P \equiv \frac{z}{\alpha}$$

- If $\theta_P < mode$ (low value of unfavorable decision), $b > 0$, i.e., *anti-agent* bias, maximizes effort
- If $\theta_P > mode$ (high value of unfavorable decision), $b < 0$, i.e., *pro-agent* bias, maximizes effort

P's welfare maximization

$$
\begin{aligned}
W &= \mathbf{E}\Pi_1 + \delta \mathbf{E}\Pi_2 = \\
&= \mathbf{E}y(\theta, e^*) + \delta \left[F(\theta_E) z + (1 - F(\theta_E)) \mathbf{E}(\alpha\theta \mid \theta \geq \theta_E) \right] \equiv \\
&\equiv t + \underbrace{e^*(\theta_E)}_{\text{Incentives}} + \delta \cdot \underbrace{A(\theta_E)}_{\text{Ex-post efficiency}}
\end{aligned}
$$

- Tradeoff between *incentives* and *ex-post efficiency*

P's welfare maximization

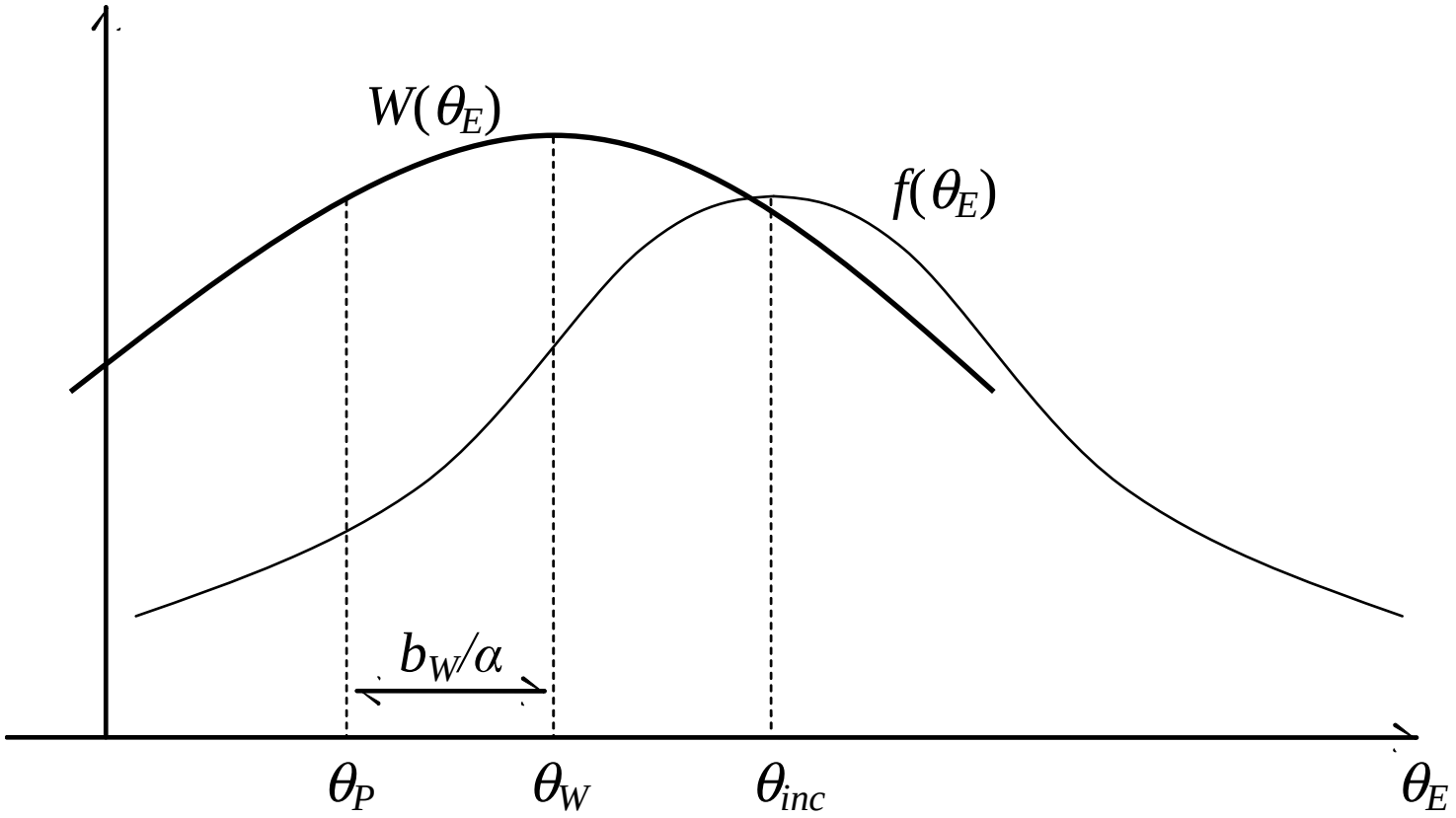
$$\frac{dW}{d\theta_E} \equiv \frac{de^*}{d\theta_E} + \delta \frac{dA}{d\theta_E} \equiv$$

$$\equiv \frac{de^*}{d\theta_E} + \delta f(\theta_E)(z - \alpha\theta_E) = 0$$

$$\text{or } \frac{de^*}{d\theta_E} - \delta f(\theta_E) b = 0 \Rightarrow \theta_W$$

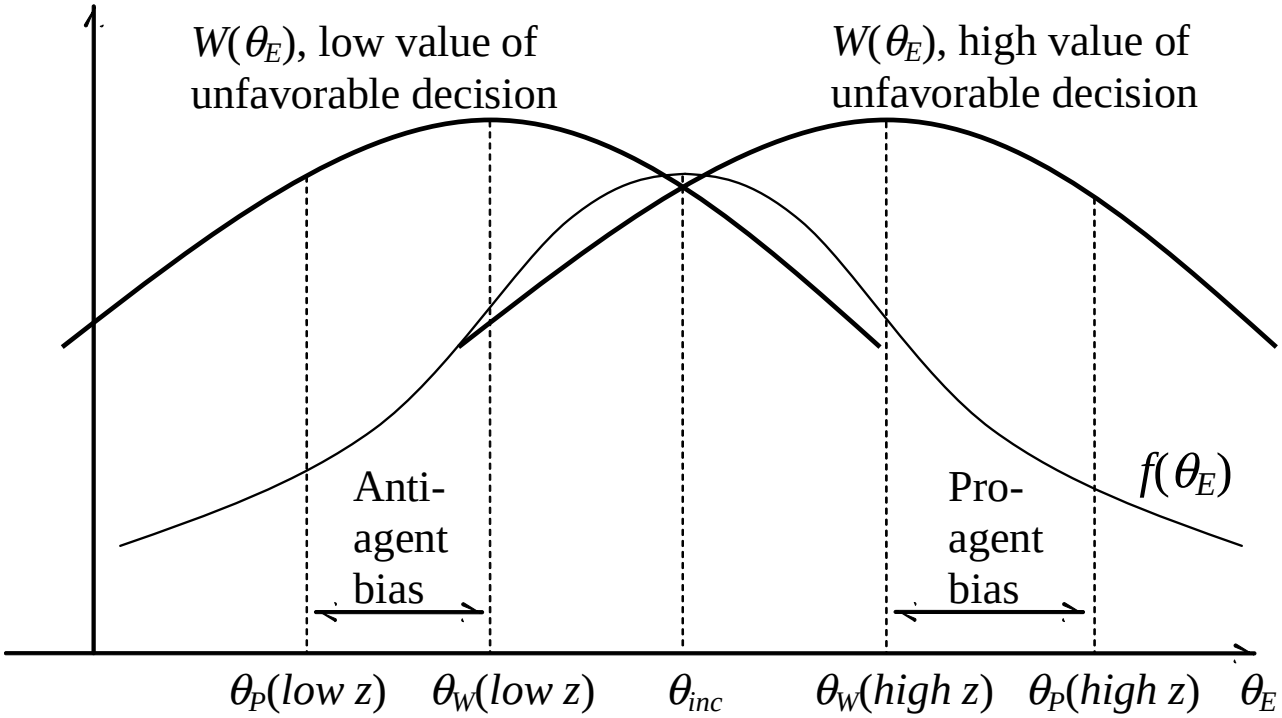
- Unless $\theta_{inc} = \theta_P$, $\theta_W \neq \theta_P$, i.e., **optimal** $b \neq 0$
- Trade off: incentives vs. ex-post efficiency $\Rightarrow$ **optimal bias has the same direction as effort-max one but is smaller**

P's welfare maximization



- Trade off: incentives vs. ex-post efficiency $\Rightarrow$ **optimal bias has the same direction as effort-max one but is smaller**

Effect of the "unfavorable decision" value, z



- For small z, $\theta_P < \theta_{inc} \Rightarrow b$ must be > 0 (anti-agent)
- For high z, $\theta_P > \theta_{inc} \Rightarrow b$ must be < 0 (pro-agent)
- **Optimal bias changes monotonically with the value of unfavorable decision: from anti-agent for small z to pro-agent for high z**

Applications

- Turnover policies (retaining vs. firing Agent)
  - Evaluator should be anti-agent when agent's job requires specific skills
    - difficult or costly to find a new agent
    - costly to train a new agent
- Interim evaluation of a reform (continue or terminate)
  - When the reform is ex-ante not very likely to suceed, evaluation committee should be pro-reform
  - When the reform is ex-ante very likely to suceed, evaluation committee should be anti-reform
- Promotion policies

Application: promotion policies

- In deciding on promotion Principal can rely on opinion of Agent's immediate boss (Middle Manager)
- Middle Manager is biased because he does not want to be replaced by Agent
- Bias can be reduced by
  - establishing less biased channels of evaluation
    - by colleagues from *other* divisions
  - designing promotion scheme that does not hurt evaluator
    - promotion to a *different* division

Application: promotion policies

- Managers are normally more skilled than agents $\Rightarrow$ high value of "status quo" $\Rightarrow$ unbiased scheme is more likely to be better
  - Promotion to a different division
  - Vertical promotion, but evaluation by colleagues from other divisions
- But what if Manager's skill becomes obsolete (changing environment, organizational transformation)
- Then it can be optimal that agents are evaluated by their "dead wood" bosses and replace them upon a favorable evaluation!

Effect of strength of career concerns

- **Strength of career concerns: higher δ_A and/or B**

$$\delta_A B f(\theta_E) = c'(e^*) \Longrightarrow \frac{de^*}{d\theta_E} = \frac{\delta_A B f'(\theta_E)}{c''(e^*)}$$

- Marginal effect of θ_E on effort, $de^*/d\theta_E$, increases
- Ex-post efficiency is not affected

$\Rightarrow$ Bias should be higher

- **Stronger career concerns call for more biased evaluation**
- Intuition: bias' role is to generate incentives; as marginal effect of bias on incentives grows, bias should be increased

Effect of uncertainty about A's ability

- In general, effect is ambiguous
- **If normal distribution and quadratic cost of effort, higher uncertainty $\Rightarrow$ lower optimal bias**

Communication vs. Delegation

- Fix the bias
- For $b_{\min} \leq b < b_{\max}$ delegation is equivalent to communication
- For b outside $[b_{\min},\ b_{\max})$
  - Communication is useless: no decision-relevant information, no effort
  - Delegation generates some incentives but hurts ex-post efficiency
  - Hence, delegation is better when incentives are more important than ex-post efficiency (e.g., low P's discount factor)
- Contrast with Dessein (2002):
  - In Dessein (2002) delegation is better only when the bias is small.
  - Crucial difference: I have effort by 3rd party, which is affected by the mode of decision-making. Delegation becomes better when communication fails to ensure effort provision.

Communication vs. Delegation

- What if bias is chosen optimally?
- If optimal bias under communication is within $(b_{\min}, b_{\max})$, delegation is equivalent to communication
- But if too high bias is needed to generate incentives (i.e., optimal bias under communication hits $b_{\min}$ or $b_{\max}$), delegation is preferred, provided that incentives are more important than ex-post efficiency

Conclusions

- Biased evaluation in a career concerns setting can be optimal
- Framework to think about optimal bias: ex-post efficiency vs. incentives
- Relative value for principal of agent-favorable vs. agent-unfavorable decision reduces anti-agent or increases pro-agent bias
- Strength of career concerns for Agent increases optimal bias
- Ex-ante uncertainty about agent's ability is likely to reduce optimal bias (more analysis needed)
- Communication versus delegation
  - Delegation may dominate communication for high biases

Further research

- Application to other settings: evaluation of government programs by committees, politicians by media, CEOs by boards of directors...
- Allowing for more conractibility
  - contractible (noisy) performance measures
  - payments conditional on favorable/unfavorable decision
  - How much contractual imperfection do we need for bias to remain optimal?
- Dynamics of internal labor market
  - M's talent is endogenous in reality. Need a dynamic selection model
  - More strict selection to managerial positions in silo $\Rightarrow$ seldom promotions, but very high quality $\Rightarrow$ lattice becomes optimal...
  - So, what's the optimal dynamic evaluation and promotion policy?
  - Is there "steady state" policy that remains optimal for distribution of M's talent it generates?