TRANSPARENCY AND INNOVATION IN ORGANIZATIONS

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MOTIVATING EXAMPLE: EULOGY

- Eulogy, a communication agency, increased transparency by invited its clients to brainstorming sessions.

- The creative team then would stop pursuing early-stage ideas if they received negative reactions from the clients.

- The CEO Adrian Brady explains:

A client's immediate negative reaction to a potentially great idea can end a conversation before it takes flight, making it hard to do anything big or new.

WHAT WE DO

Two-period principal-agent model without incentive contracts

Aim: exploring how transparency affects incentives to innovate

Our transparency: the availability of observable, but non-contractible interim performance measures

- Management/supervisors/coworkers share performance measures (e.g., corporate culture)

- A supervisor gives straight feedback to its subordinate

- Internal seminars

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WHAT WE DO

Innovation consists of two stages: **idea generation** and **idea implementation** (Anderson et al., 2014).

- **Idea implementation** is the process of converting new ideas into new and improved products, services, or ways of doing things

Key Tradeoff:

- **Transparency is more likely to induce idea generation.**
- **Transparency hurts idea implementation incentive.**

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THE MODEL

OVERVIEW

- Two-period principal-agent model

- Output depends on **A's effort** and **value of idea**
  - In each t, **A** chooses "**new idea (N)**" or "**known idea (K)**"
    - Initiating new idea incurs a setup cost $k > 0$, $k = 0$ in this presentation.
  - In each t, **A** chooses e_t at cost $c(e_t) = \frac{1}{2} e_t^2$

- **P** can commit ex-ante to make the organization. "**transparent**" or "**opaque**"
    - **P** cannot write any contingent contracts

- Only under **transparent** org, **P** and **A** can observe interim performance measure.

- **Interim output** given $i_1 \in \{N, K\}$ and e_1:

$$x_1 = \gamma V(i_1) + (1 - \gamma)e_1$$

- $V(N) = \theta$: **value of new idea**
  - Unknown to both parties
  - $\theta \sim U[0, 2\mu]$ and $E[\theta] = \mu$
- $V(K) = \mu$: **value of known idea**

- $\gamma \in (0,1)$: **relative Importance of idea quality over effort**

BETWEEN THE TWO PERIODS

- Under **transparent org**, **P** and **A** observe signal s about x_1:

$$s = x_1 + \varepsilon$$

- $\varepsilon \sim F_\varepsilon$: measurement error

  - **Perfect signal**: $\varepsilon = 0$ always

  - Extensions to imperfect signal:
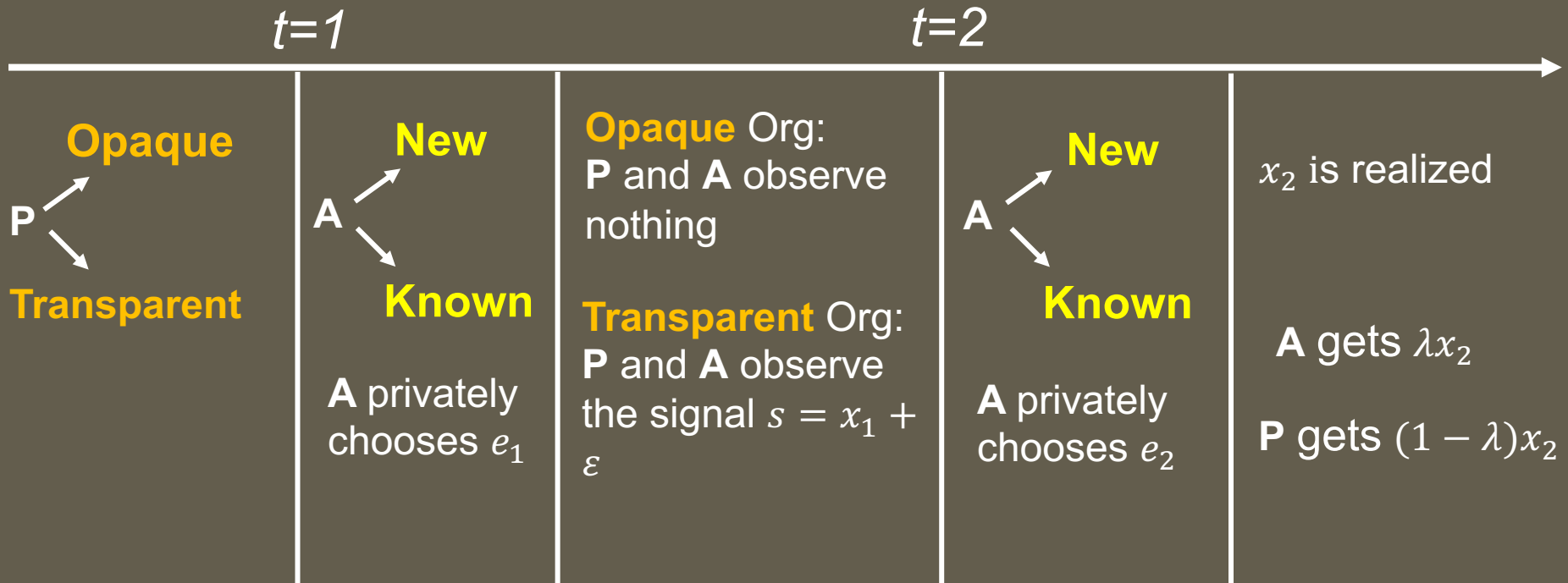   (Case 1) $\varepsilon \sim U[-d, d]$ and (Case 2) $\varepsilon \sim N(0, \sigma_\varepsilon)$

PERIOD 2

- **Final output** given (e_1, e_2, i_1, i_2):

$$x_2 = \begin{cases} \gamma V(i_2) + (1-\gamma)(e_1 + e_2) & \text{if } \mathbf{A} \text{ keeps the same idea } (i_1 = i_2) \\ \gamma V(i_2) + (1-\gamma)(\rho e_1 + e_2) & \text{if } \mathbf{A} \text{ switches idea}(i_1 \neq i_2) \end{cases}$$

  - e_1 : the degree of the **acquired knowledge**
  - $\rho \in [0,1]$: the **generality** of the acquired knowledge

- **Wasting effect**: upon switching, the contribution of past effort is reduced by $(1-\gamma)(1-\rho)e_1$.

  - **Wasting effect is greater when the knowledge is specific (small ρ)**

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TIMELINE

$t=1$ $t=2$

Opaque

P

Transparent

New

A

Known

A privately chooses e_1

Opaque Org:
P and **A** observe nothing

Transparent Org:
P and **A** observe the signal $s = x_1 + \varepsilon$

New

A

Known

A privately chooses e_2

x_2 is realized

A gets λx_2

P gets $(1 - \lambda)x_2$

A does not choose **new idea** after adopting **known idea** in *t=1*

ANALYSIS

- **A** works with **known idea** in each period.

  - The expected value of each idea is $E[\theta] = \mu$ since **A** cannot learn θ, and **A** has no incentive to switch due to **wasting effect**.

- **A** jointly chooses (e_1, e_2) to maximize

$$\pi(K) = \lambda E[x_2 \mid i_1 = i_2 = K] - c(e_1) - c(e_2)$$

$$= \lambda\{\gamma\mu + (1 - \gamma)(e_1 + e_2)\} - c(e_1) - c(e_2)$$

- $e^{\mathrm{OP}} \coloneqq e_1^{\mathrm{OP}} = e_2^{\mathrm{OP}} = \lambda(1 - \gamma)$

  - No complementarity between idea quality and effort.

TRANSPARENT ORGANIZATION

- Transparency reveals the value of new idea and may lead to the switching of an idea.

  - **A** switches his idea with positive probability for $\gamma > \gamma_A$.

- A tension between **idea sorting** and **idea implementation**:

  (+) Sorting effect: transparency improves the expected idea quality by better sorting.

  (-) Demotivating effect: the possibility of wasting his effort hurts **A**'s effort incentive in *t=1*, as in Eulogy example.

  - Sorting effect dominates if γ is sufficiently high.
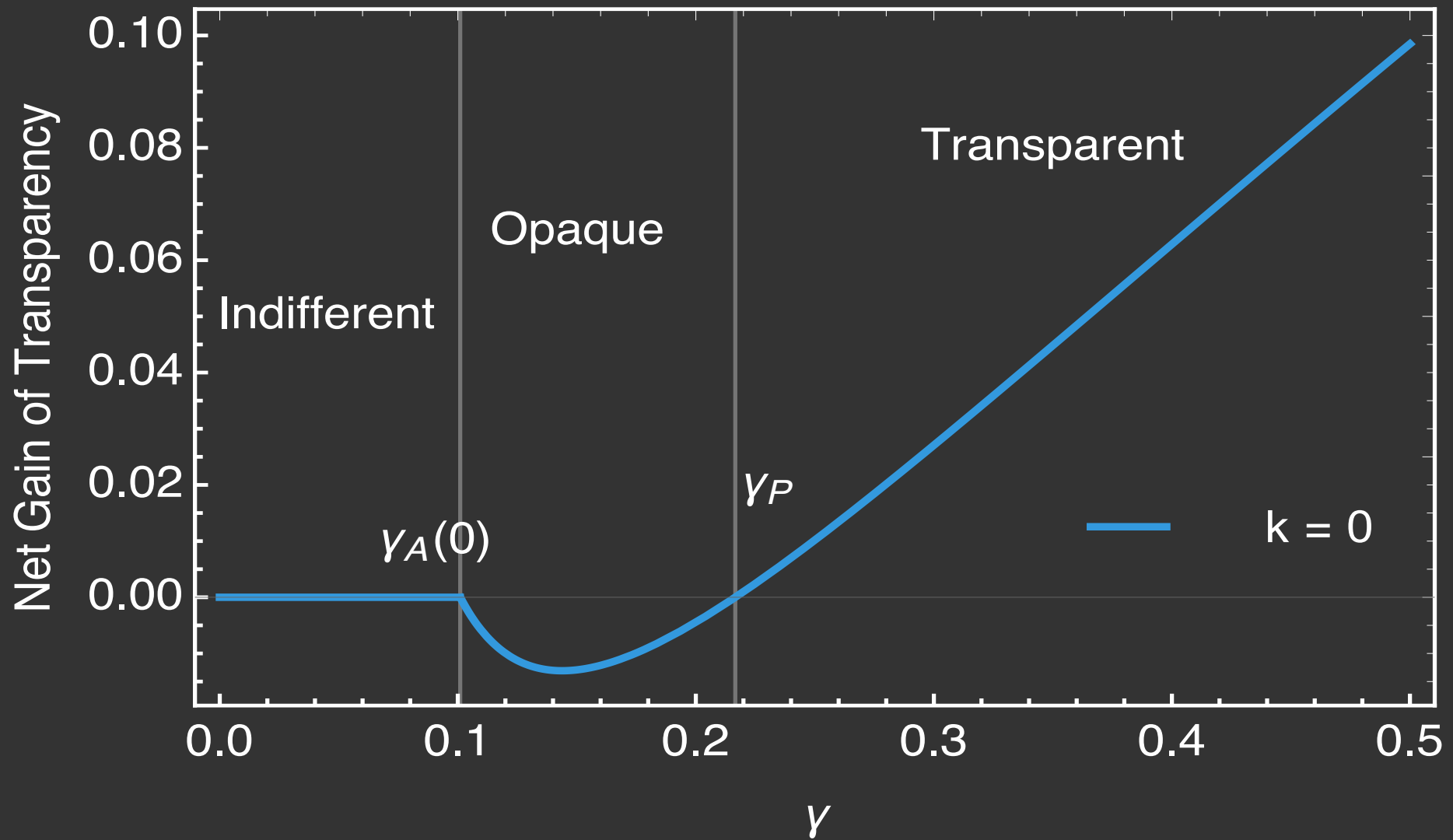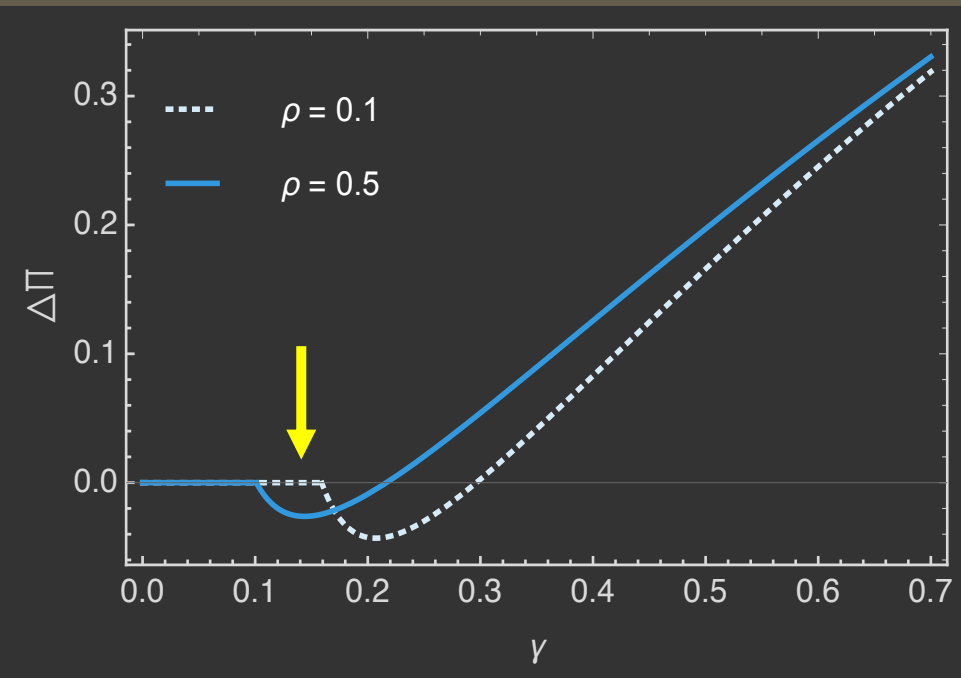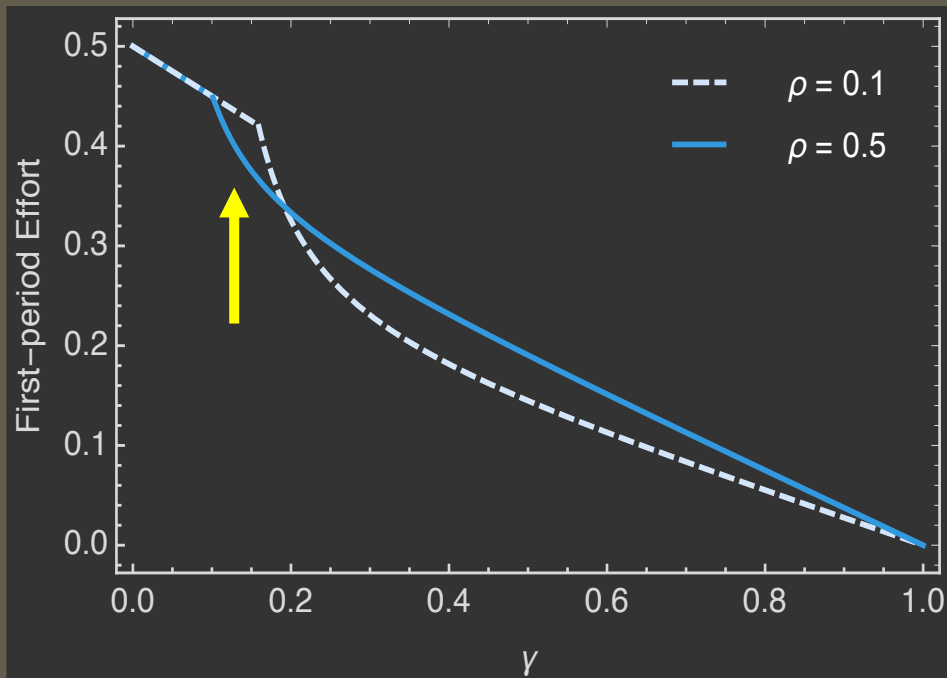
$$\Delta \Pi := \Pi^{TR} - \Pi^{OP}$$

ROLE OF SKILL GENERALITY ρ

ROLE OF SKILL GENERALITY

- Recall that the demerits of switching ideas are the wasting effect and the demotivating effect.

- As the knowledge becomes more general (ρ increases), these demerits are reduced.

- Larger $\rho \implies e_1^{TR}(N)\uparrow$ and $\Pi^{TR}\uparrow$

This conjecture is false!

We consider a limiting case $k \to 0$

ROLE OF SKILL GENERALITY

- Imagine ρ rises so that the acquired knowledge becomes more general.

    $(+)$ Less waste of past effort, which is motivating

$(-)$ Switching probability increases, which is demotivating

- If γ is so small that effort matters a lot and switching rarely occurs, the latter effect dominates.

  - $e_1^{\mathrm{TR}}(N)\downarrow$
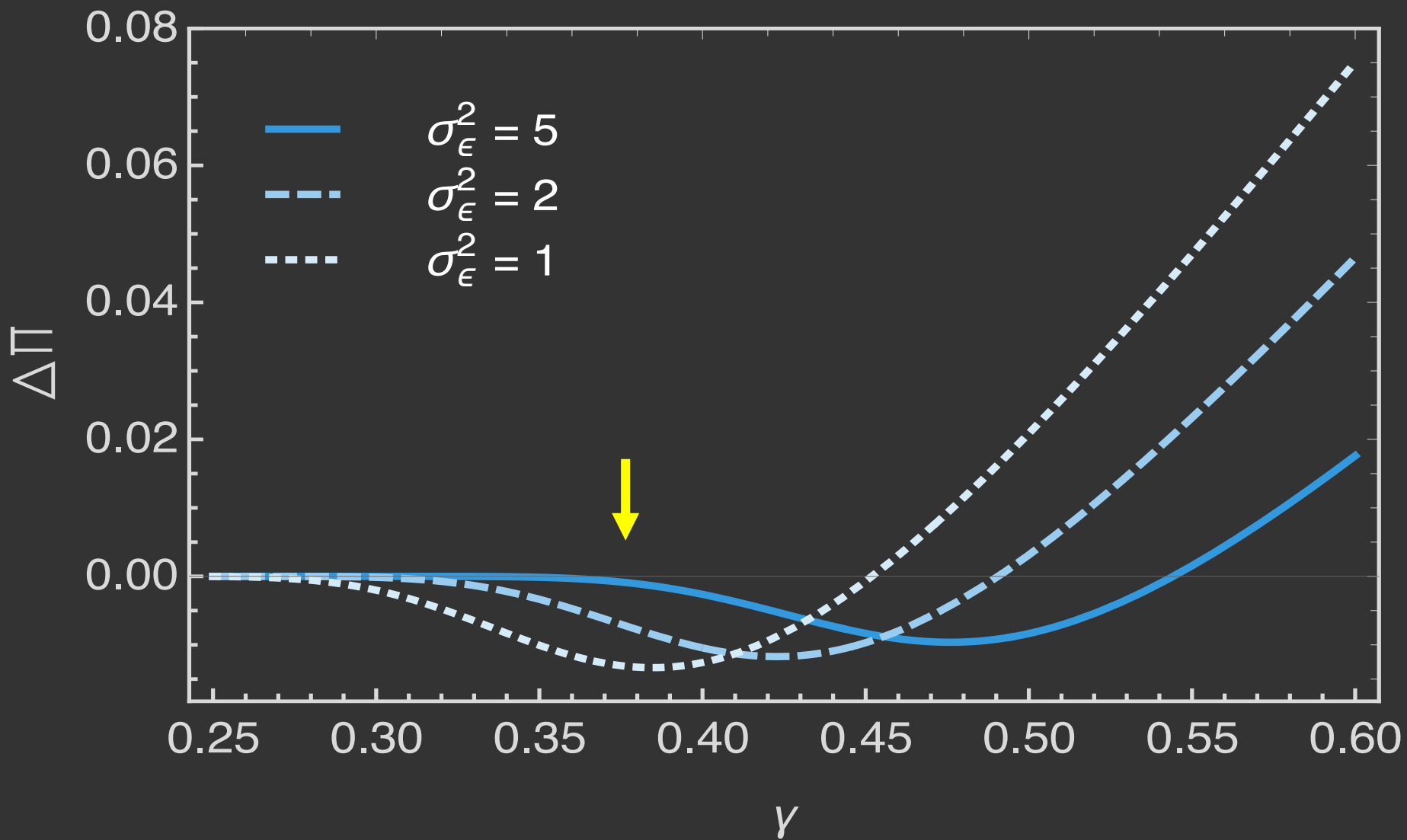 - $\Pi^{\mathrm{TR}}\downarrow$

ROLE OF SIGNAL PRECISION

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(Case 1) Both θ and ε are uniformly (and independently) distributed

(Case 2) Both θ and ε are normally (and independently) distributed

- σ_ε^2: variance of the measurement error ε (signal's precision)

- As the signal becomes more precise, transparency is more likely to be beneficial by better sorting?

ROLE OF SIGNAL PRECISION ON Π^{TR}

When interim performance measure is less precise:

1. **Sorting effect** is smaller (i.e., idea quality improves less)
2. Switching probability is reduced, which increases first-period effort incentives; thus, $\dfrac{de_1^{\text{TR}}}{d\sigma_\varepsilon} > 0$

If γ is so small that effort matters a lot

$\Longrightarrow$ Switching rarely occurs

$\Longrightarrow$ The latter effect dominates the former $\Longrightarrow \Pi^{\text{TR}} \uparrow$

CONCLUDING REMARKS

- We show that transparency facilitates idea generation, but it is counter-productive if idea implementation is important.

- Transparency may become more counter-productive if

    (i) **the acquired knowledge becomes less idea-specific** or

    (ii) **the interim performance measure becomes more precise.**

THANK YOU!