Lecture 16: Knowledge as Compensation

Compensation in Organizations

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Garicano and Rayo (2025)
(Not Yet Published)

Garicano (2025)
(Blog Post on Silicon Continent)

Medieval Apprentices and Generative AI?

- Smart people are willing to do grunt work. What are examples?

- It is hard to get firms to provide general training to workers. Why?

- How does this connect to medieval apprenticeships?
  - Entry-level workers reap the gains of training through future wages.

  - Entry-level workers do not have the money to pay for training today.

  - So they pay for training via grunt work.

Transferring Knowledge

▶ Time is continuous and infinite: $t \geq 0$.

▶ Both the firm and the worker exponentially discount the future at rate r.[1]

▶ Expert E commits to wage path $\{w_t\}$ and knowledge transfer path $\{x_t\}$.
  ▶ Starting knowledge is 0, maximum is 1, knowledge cannot decrease.

▶ The Apprentice's output at time t is 0 if $x_t < \theta$, and $(x_t - \theta)$ otherwise.

▶ While employed, the Apprentice A gets the discounted flow of wages.

▶ Apprentice decides a time to quit $\tau \geq 0$, they work for themselves and receive the discounted flow of their output forever after.

▶ The expert gets the discounted flow of output less wages while the worker is employed, and 0 after.

1. Do not worry I will show what this means.

Transferring Knowledge: Adding Generative AI

- ▶ Where was AI?

- ▶ The parameter θ represents the level of generative AI.

- ▶ As θ rises AI can perform more of the basic knowledge tasks.

- ▶ The expert and apprentice cannot sell tasks that AI can do. Why?

The Apprentice Becomes the Expert!

Theorem 1

During a training period that lasts from $0 \leq t \leq \frac{1}{r}$, the apprentice receives 0 wages ($w_t = 0$) and knowledge is transferred:

$$x_t = \theta + (1 - \theta)e^{-1}exp(rt).$$

From $\frac{1}{r}$, all knowledge has been transferred ($x_t = 1$) and the apprentice is paid all output $w_t = y_t = 1 - \theta$.

▶ The apprentice stays for 0 wages initially! Why?

▶ The apprentice is given an immediate burst of knowledge. Why?

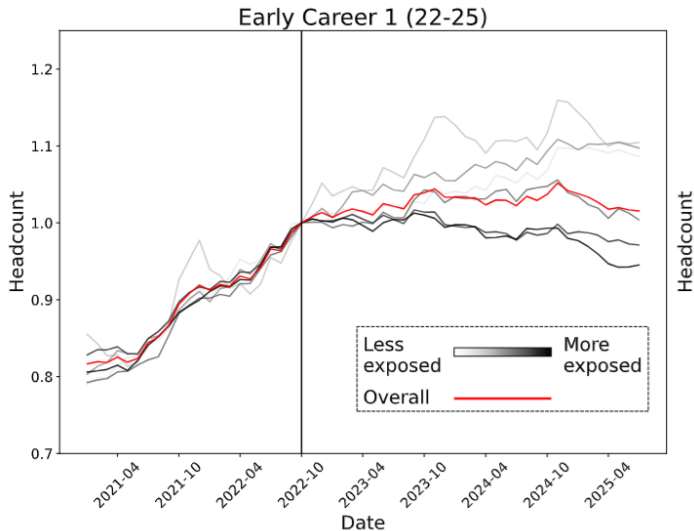# Generative AI and the Old Training Model

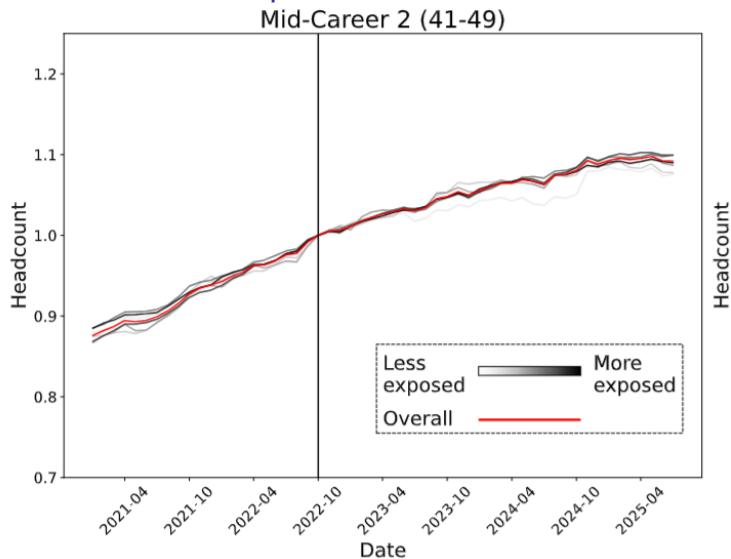▶ Profit for the expert from training the apprentice is given by:

$$\Pi = \frac{1 - \theta}{r \cdot e}$$

▶ As θ rises, profit falls, eventually converging to 1 when AI reaches the expert.

▶ Entry-level workers benefit through wages from general training/knowledge.

▶ The old "deal" was that entry-level workers did menial work for cheap in exchange for training.

▶ This grunt work compensates the expert for the training.

▶ AI destroys this paradigm.

Employment Growth and AI Exposure: Early Career

Early Career 1 (22-25)

"Canaries in the Coal Mine?" by Brynjolfsson, Chandar, Chen (2025)

Employment Growth and AI Exposure: Mid-Late Career

"Canaries in the Coal Mine?" by Brynjolfsson, Chandar, Chen (2025)