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?

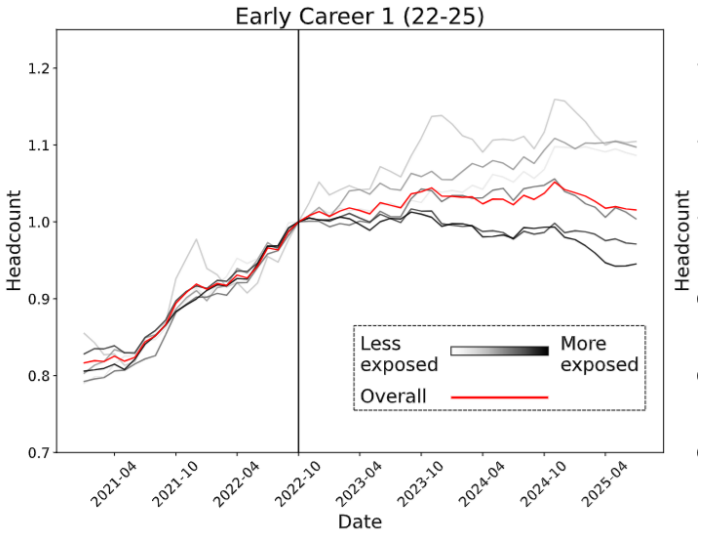
Generative AI and the Old Training Model

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

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

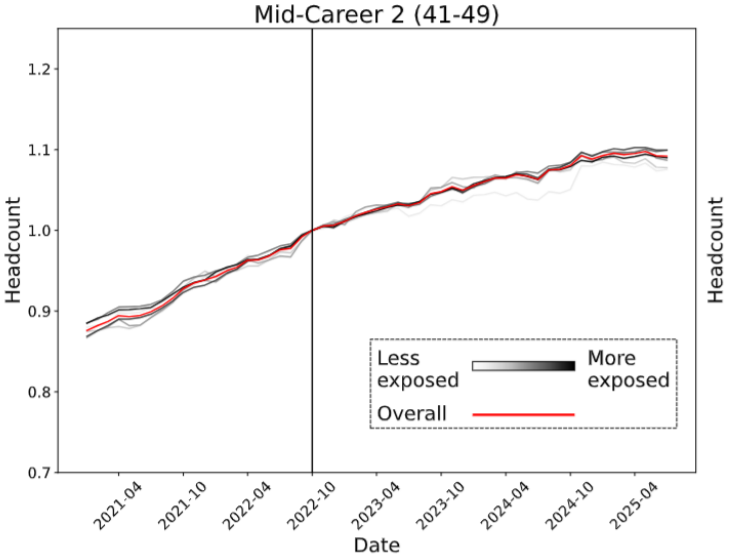
- As θ rises, profit falls, eventually converging to 1 when AI reaches the expert.
- Entry-level workers benefit through wages from general training/knowledge.
- The old "deal" was that entry-level workers did menial work for cheap in exchange for training.
- This grunt work compensates the expert for the training.
- AI destroys this paradigm.

Employment Growth and AI Exposure: Early Career



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

Employment Growth and AI Exposure: Mid-Late Career



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