Discussion of AI in the Knowledge Economy Ide&Talamàs

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Evidence

Displacement at the bottom:

- Canaries in the coalmine (Brynjolfsson, Chandar, and Chen, 2025a)
  - Payroll and vacancy data show sharp declinesntry roles in AI-exposed jobs (e.g., junior coding) post-2022
  - While older workers gain.
- Seniority matters (Lichtinger and Hosseini Maasoum, 2025)
  - Within adopters, junior employment falls mainly through *slower hiring*,
  - while promotions of incumbents rise;
  - junior–senior gap widens as GenAI diffuses.

Evidence

Firm-level: AI assistants help most the least experienced workers.

- Brynjolfsson, Li, and Raymond (2025b) 5,179 customer support agents shows disproportionate gains at the bottom.
- Cui, Demirer, Jaffe, Musolff, Peng, and Salz (2025)
  - Field experiments at Microsoft, Accenture, and a Fortune 100 firm to test how an AI coding assistant affected developer work.
  - Combining data from $4,867$ developers, those using the AI tool completed 26.08% (SE: 10.3%) more tasks.
  - Less experienced developers adopted the AI tool at higher rates and saw greater gains in productivity.
- Kanazawa et al. (2025) AI improves taxi drivers' productivity by shortening the cruising time, and such gain is accrued only to low-skilled drivers (narrow skill gap by 14%).
- Dell'Acqua et al. (2023): GPT-4 boosts BCG consultants' completion rate; +43% for below-median performers.
- Noy and Zhang (2023): ChatGPT users write 40% faster with 18% higher quality; gains concentrated in low skill group.

The hierarchical organization of expertise

Starting point: Hierarchy is about efficient use of tacit knowledge in production.

- AI is able to replace the use of tacit knowledge

Key inputs: expertise and time. In knowledge hierarchies (Garicano, 2000; Garicano and Rossi-Hansberg, 2006):

- Workers handle routine cases; experts handle exceptions.
- This shields experts and raises output when expert time is scarce.
- Hierarchies reflect knowledge, not power:
  analyst $\rightarrow$ manager $\rightarrow$ partner; resident $\rightarrow$ attending; line worker $\rightarrow$ engineer.

Problems and knowledge. Each project involves a problem of difficulty $x \sim U[0,1]$. An agent with knowledge z solves it with prob. z.

Management by exception. If a worker fails, she escalates to a solver. Each query uses $h \in (0,1)$ units of solver time.

AI (Ide–Talamàs)

AI.
An algorithm with fixed knowledge z_{AI}. Firms can deploy it as independent producer, worker, or solver (Ide and Talamàs, 2025).

Discussion: What happens in this framework as AI improves?

- smarter (solves more problem) abundant
- *price* of compute goes to 0.
- choice of autonomy is critical

Two regimes

Regime A (Ide and Talamàs, 2025 baseline): compute scarcer than opportunities Compute is abundant relative to human time, but *scarce* relative to opportunities. There always are more problems to solve.
Equilibrium facts.

- The compute rental price equals AI's stand-alone success: $r^* = z_{AI}$.
- Some compute must be used in single-layer production.
- Occupational stratification with positive sorting: $W^* \preceq \{z_{AI}\} \preceq S^*$; no unemployment.

Interpretation. Scarce input is human solver time. Even very strong AI is paired with humans on the margin to lift value where human time binds.
Regime B (compute glut– "transformative AI"): compute more abundant than opportunities
Assumption. Compute exceeds opportunities. Opportunities generate output z_{AI}; compute is free: $r^* = 0$.

Regime A. Opportunities abundant relative to compute

Assumption. Compute is abundant relative to human time, but *scarce* relative to opportunities.

	Basic AI (z_{AI} low)	**Expert AI** (z_{AI} high)
Autonomous	**Superstars & displacement across occupations**. AI displaces workers, complements problem solvers.	**Convergence to co-pilot**. AI cannot replace all humans because human time binds and compute has price.
Non autonomous	**Novice augmentation**. Humans execute; asks AI for help with harder problems (taxis, customer support papers).	**Great Compression**. Everyone partners with AI and produces the same.

Under this baseline, the two "high-AI" cells converge because the scarce factor is human solver time and compute carries an opportunity cost.

Regime B. Compute Super Abundant $r^* = 0$: dystopia or compression?

	Basic AI (z_{AI} low)	**Expert AI** (z_{AI} high)
Autonomous	**Superstars & entry displacement**. AI automates routine work; humans with $z \leq z_{AI}$ exit; top humans benefit.	**Full dystopia (or utopia?)**. If z_{AI} surpasses nearly all humans, AI performs most tasks; no human contribution.
Non-autonomous	**Novice augmentation**. Humans execute; asks AI for help with harder problems (taxis, customer support papers).	**Great Compression**. Everyone partners with AI; wages compress.

As AI improves

Ide–Talamàs.

- AI takes over routine workers first.
- But eventually helps them!
- Displacement is also about *how cheap* compute is and how firms deploy it.
  - With compute scarce relative to opportunities ($r^* > 0$), human time binds and high–AI tasks converge to co-pilot teams.
  - Once $r^* = 0$, autonomy is key:
    - autonomous $\Rightarrow$ automation (up to dystopia if quality is high);
    - co-pilot $\Rightarrow$ great compression.
- Thoughts on autonomy:

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