

AI and the Extended Workday:
Productivity, Contracting Efficiency, and Distribution of Rents
By Jiang, Park, Xiao, and Zhang

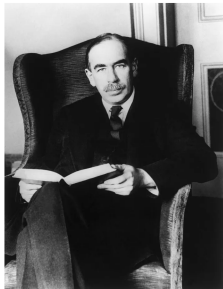
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Question

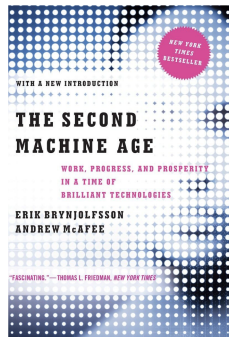
- **Research question:** How do recent AI technologies affect work hours?
- This is part of a long-standing question in economics: how do technology advancements affect work and leisure

- John Keynes predicted in 1930 that by 2030, people would work only 15 hours per week.



- “Technological progress is going to leave behind some people, perhaps even a lot of people, as it races ahead. But it also has the potential to generate enormous bounty—more output, more wealth, and yes, **more leisure.**”

— Erik Brynjolfsson & Andrew McAfee, *The Second Machine Age* (2014)



This Paper

- Measure occupational exposure to AI technologies by analyzing texts of occupation task descriptions and patent filings using LLM
 - Importantly, the measure differentiates between complementarity and substitution between AI technologies and tasks
- Measure work hours using American Time Use Survey over the last two decades and surveying 20-30k workers annually
- Impressive data work and surprising finding: AI technologies lead to **more work** and **less leisure**

Context: Employment Effects of Technological Change

- A long literature has looked at how AI and other technologies affect employment (on the **extensive** margin):

Autor and Dorn (2013), Felten, Raj, and Seamans (2019), Acemoglu and Restrepo (2020), Acemoglu, Autor, Hazell, and Restrepo (2022), Babina, Fedyk, He, and Hodson (2023, 2024), Kogan, Papanikolaou, Schmidt, and Seegmiller (2024), Gathmann, Grimm, and Winkler (2024), Hampole, Papanikolaou, Schmidt, and Seegmiller (2025)

- Overall conclusions:
 - AI technologies increases employment of occupations with complementary tasks
 - Employment of jobs with tasks replaceable by AI decreases (as of now this effect is small compared to IT/robots)
 - Increase in employment due to higher firm productivity/demand
- So far no evidence on how AI technology affects work on the **intensive** margin

Intensive vs. Extensive Margin

- Are the intensive margin results an extension of the extensive margin results or is there something fundamentally different?
- Some of the observed effects seem to reflect extensive margin changes
 - When excluding unemployed workers, effect drops from 0.034*** to 0.016*
 - When controlling for part-time dummy, effect drops from 0.034*** to 0.018**
 - Jobs with the highest AI exposure have average work hours < 40 per week
- Suggestions:
 - Exclude the unemployed *and* add part-time dummy. Do you see any effect for full-time workers?
 - Quantile regression: is the effect driven by part-time/low-hours workers moving closer to full time or full-time workers working overtime?

Intensive vs. Extensive Margin

- The main finding of the paper—AI technology increases work hours for jobs with tasks complementary with AI—is in line with previous literature on extensive margin
 - The labor economics literature shows that demand-side factors play an important role in determining hours: Ham (1985), Meghir (1989), Card (1991), Blundell, Ham and Ham and Reilly (2002), Valletta, Bengali and van der List (2020)
- The paper proposes two additional mechanisms:
 1. AI improves productivity monitoring, which increases work hours
 - However, improvements in monitoring may not correlate with AI exposure
 2. Workers do not capture rents from AI technologies and have to work more
 - This seems inconsistent with higher wages in AI-exposed occupations
- Overall, it is not clear these additional mechanisms are needed to explain the findings

Intensive vs. Extensive Margin

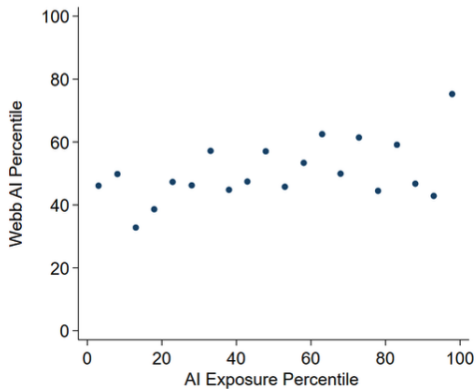
- What else can be different between intensive and extensive margin?
 - Labor supply can lead to differences between intensive and extensive margin: if it's hard to hire new workers, existing workers work more. In particular, AI technology may raise expertise requirements, which raises wages but reduces the set of qualified workers (Autor and Thompson, 2025)
 - AI technology makes job more meaningful (reducing the disutility of work) and enables high-skilled workers to work longer hours to advance their careers (Gicheva, 2013; Cortes and Pan, 2019)
 - Low-wage workers may prefer long hours (Dube, Naidu, and Reich, 2022; Lachowska, Mas, Saggio, and Woodbury, 2023)
- Suggestion: explore more heterogeneity in the data
 - Regional variation in labor supply
 - High-wage vs. low-wage workers
 - Young workers vs. old workers

Measurement

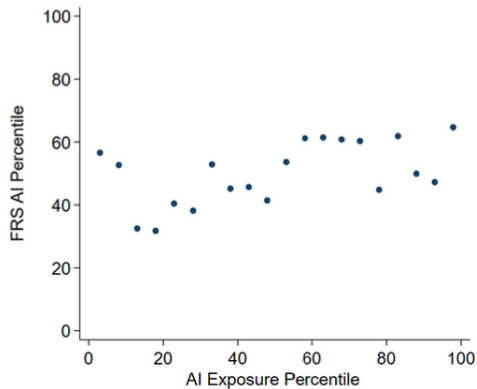
- The paper compares texts of AI patents and occupation task descriptions to measure occupational exposure to AI technologies. This creates several potential issues:
1. The definition of AI patents is very broad. For example, in 2005, there are around 50,000 AI patents, which is about a third of all patents
 2. There is a long lag between innovation and application of AI technologies
 - Diffusion of general purpose technologies often take many decades (Kalyani et al., QJE forthcoming)
 - There may be common shocks affecting both labor demand and innovation and driving the effects
 - The paper considers a one-year lag, and Kogan, Papanikolaou, Schmidt, and Seegmiller (2024) using similar data and strategy consider a 10-year lag
 3. The most highly-cited patents are not necessarily those with the widest commercial application

The measure is uncorrelated with other AI exposure measures

A: Webb AI Exposure



B: Felten et al. AI Exposure



AI Exposure Measure

- Suggestions:

1. Consider a longer lag

2. Measure the application of AI technologies instead of AI patents

- Hampole, Papanikolaou, Schmidt, and Seegmiller (2025) uses worker resumes to measure how AI use cases and then map to task descriptions.
- For example, an AI worker at JP Morgan with job description mentioning using AI to forecast risk would imply that the AI technology can perform task “analyze credit data and financial statements to determine the degree of risk involved in extending credit or lending money”

Other Comments

- The paper focuses on complementarity, but substitution of tasks is equally important. Do you see that AI reduces hours in jobs with tasks that can be replaced by AI?
- How do other technologies like robots affect hours? Is AI different?
- How do you deal with workers who switch occupations after being exposed to AI?
- The paper argues that workers have more power in regions with high-union density, but unions are also known to resist AI. Do you see more positive wage effects in high-union-density regions?
- Can you compare the magnitudes of the intensive margin to the extensive margin estimated in the literature?