# AI and the Future of Work in an Ageing Economy

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**PRC SYMPOSIUM, WHARTON BUSINESS SCHOOL**

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# This chapter

1. How predisposed are older workers to navigate a shifting labor market?
   - Indicators of labor market “fluidity”

2. Are older workers more or less exposed to the opportunities and risks of AI-driven structural transformation?
   - Conceptual framework of occupational exposure and complementarity to AI
   - Which occupations are older workers mostly employed in?
   - Are AI-benefiting occupations also conducive to longer working lives?

3. Are the implications different for current vs future generations of older workers?

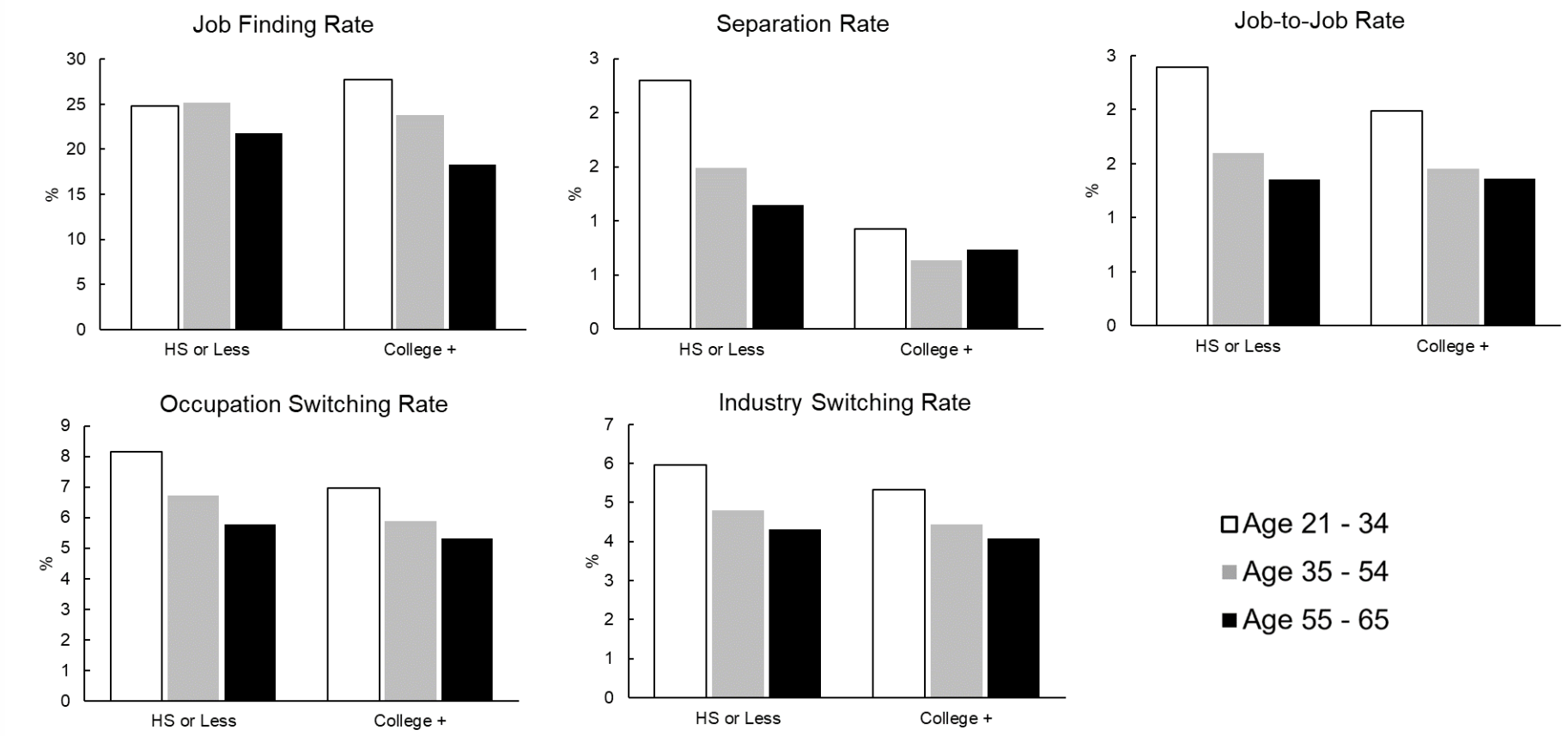
4. Are there indirect channels through which AI may affect labor supply decisions?

- Use CPS, ACS, Census Data; Older workers: 55-69, Prime-Age: 35-54

- Focus on males, but results also hold for females

# How resilient are older workers to a shifting labor market?

- Labor market “fluidity” indicators suggest older workers may be less likely to make career changes and adjust to structural transformation




Source: CPS. 2010-2019. Note: Males only.

# A conceptual framework for the impact of AI on the labor market

- Exposure (Felten et al. 2021): scope for AI use based on overlap between an occupation's essential skills and applications of AI

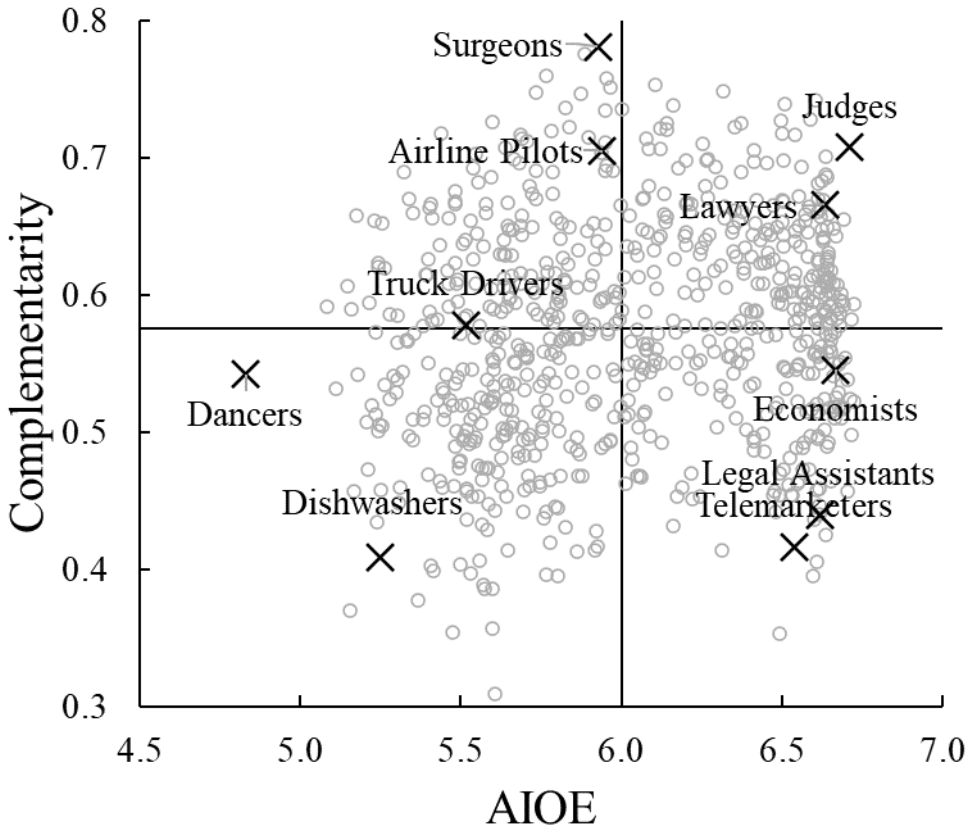
- Complementarity (Pizzinelli et al. 2023): scope for AI to replace or augment workers in a job:
  - (i) Social context of a job: criticality, responsibility for others, independent decision making, in-person interactions, physical location of job
  - (ii) Level of education and training needed
  - Aims to capture societal preferences, ethical concerns, physical implementation issues

- Both measures are constructed for 700+ US SOC 2010 occupations using O*NET, a large repository of occupation-specific information

# A conceptual framework for the impact of AI on the labor market

- **High Exposure & High Complementarity (HEHC):** greater likelihood of AI functioning as a supporting technology, higher productivity and wage
- **High Exposure & Low Complementarity (HELC):** greater probability of AI replacing workers in essential tasks, fall in labor demand and wages
- **Low Exposure (LE):** limited direct impact due to reduced scope for AI application in essential tasks
- Caveats: Complementarity still requires worker to have to relevant skills, social preferences/context behind complementarity can evolve over time

**AI Exposure and Complementarity of SOC 2010 occupations**

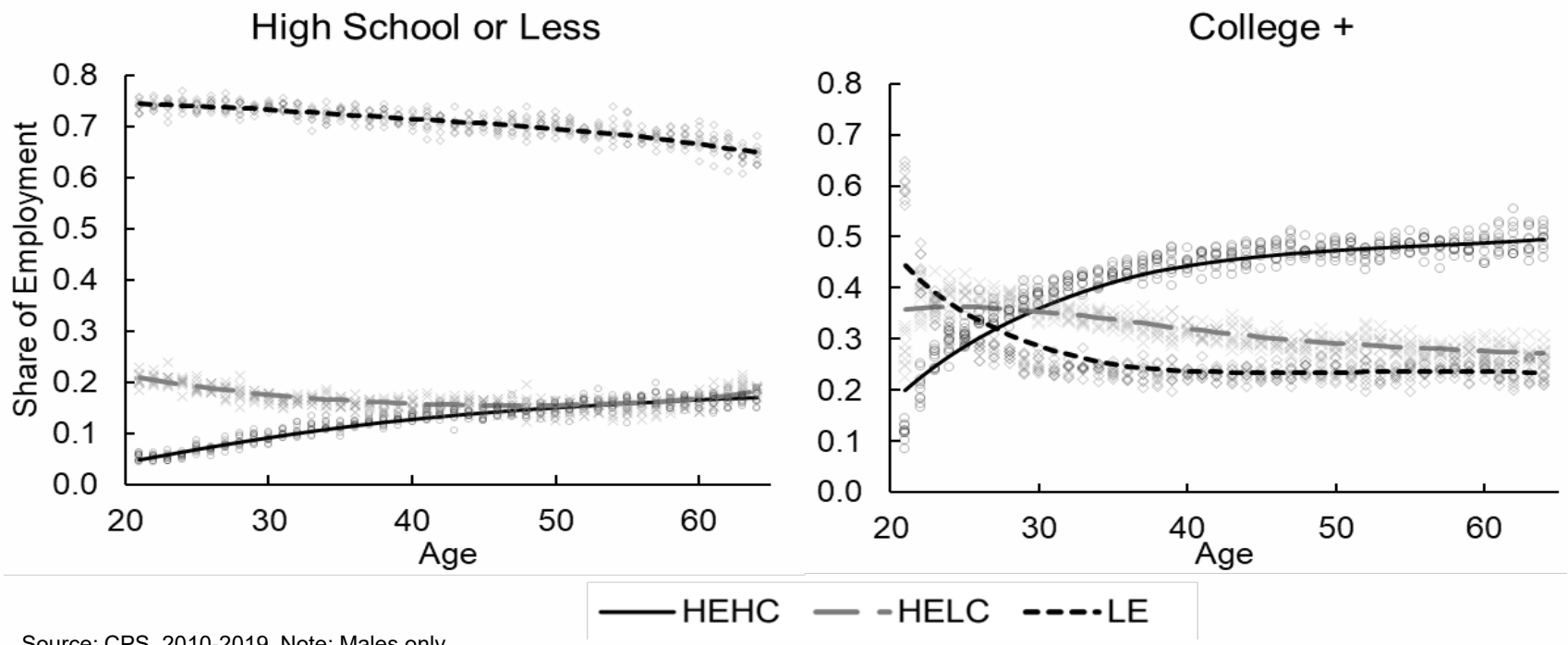



Source: Felten et al. (2021), Pizzinelli et al. (2023).

# Higher share of HEHC jobs among older workers, conditional on education level

- Older workers, for a given education level, have a higher share of employment in HEHC jobs.
- The current generation of old workers is better positioned to benefit from in the short run than young and prime-age workers
- But education differences are very substantial and perhaps more critical

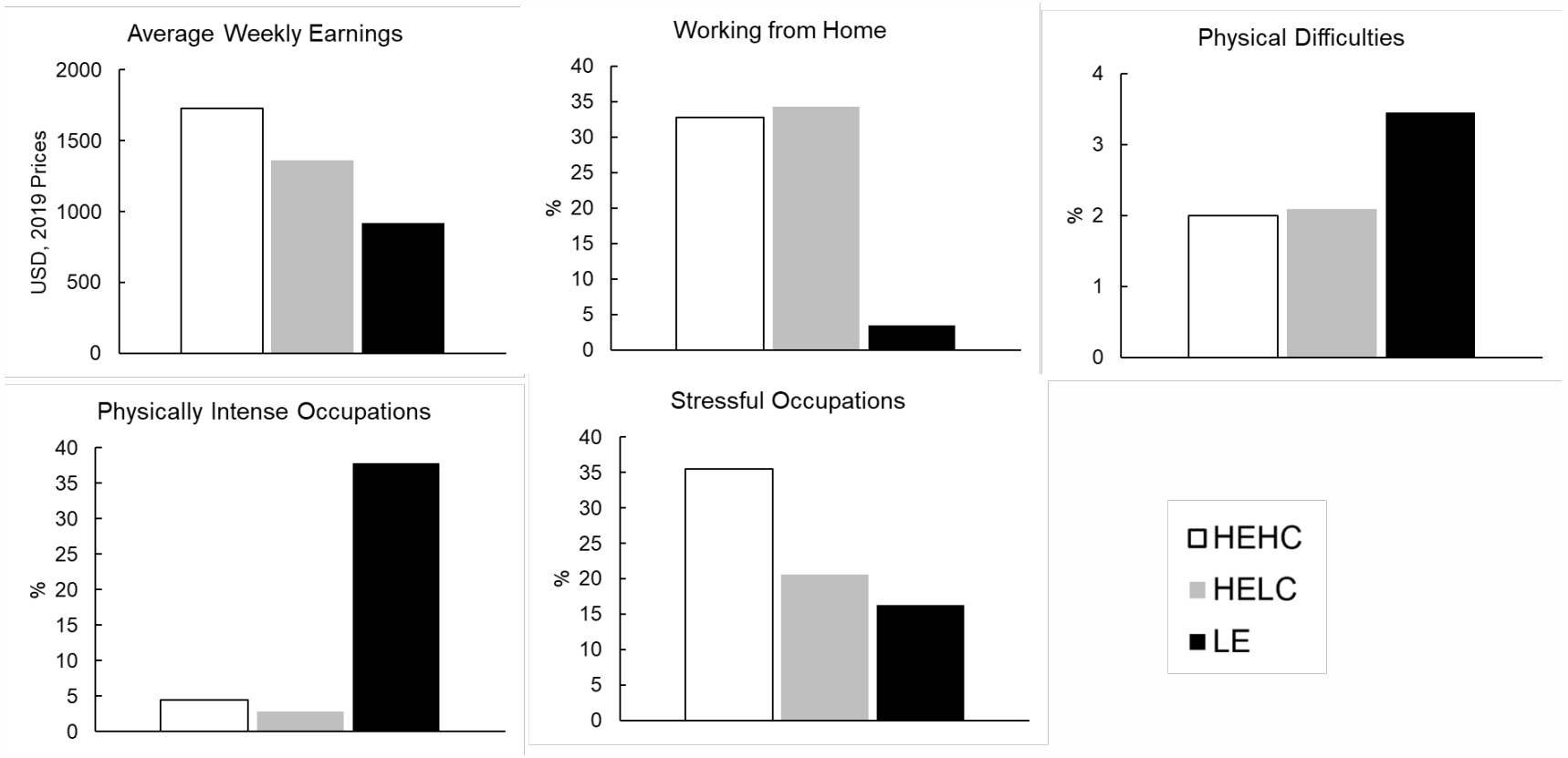
**Workers' Employment Share by Occupation Type**




Source: CPS. 2010-2019. Note: Males only.

# Are HEHC jobs old-age friendly?

- Many features of HEHC jobs may be conducive to longer working lives: higher earnings, ability to telework, low physical intensity, better health outcomes
- But they also entail higher levels of stress




Source: CPS. 2010-2024. Note: Males, aged 55+ only.

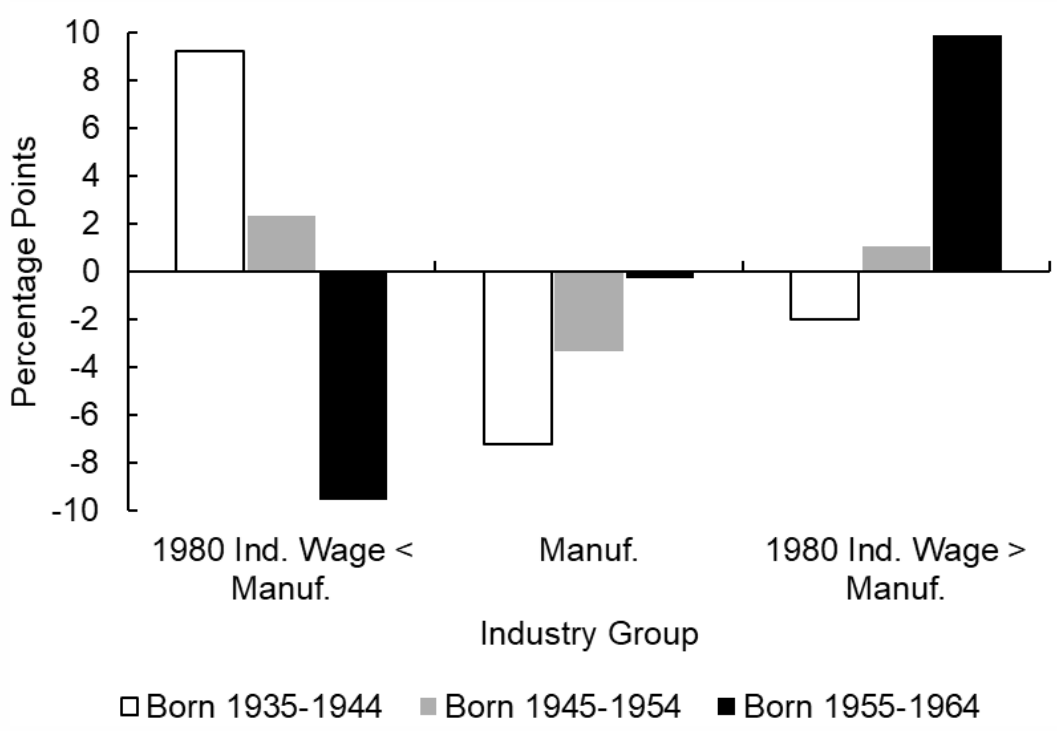
# What about future generations of old workers?

- Current prime-age and young workers may adjust differently to structural transformation. Prime-age workers may have a harder time transitioning to other sectors and limited ability to acquire new skills
- Thus, different generations would reach late stages of their careers in very different conditions

- Historical case study of routine-biased automation over 1980-2000
- Large decline in manufacturing and routine-intensive jobs

1. 1980 old/prime-age cohort: mostly relocated to industries with lower wages
2. 1980 young/prime-age cohort: more balanced shift
3. 1980 young workers, mostly moved to high-wage industries

**1980-2000 Change in employment across industries by birth cohort**




Source: Census and ACS. 2010-2019. Note: Males only.

# Another indirect channel: Rise in equity income

- As AI-drive productivity raises firms' profits, equity holders benefit from higher incomes
- Some older workers have higher holdings of equities (directly and through retirement funds
- Rise in capital income can benefit also those who do not benefit via their labor income
- Ambiguous effect on retirement age

**Table 1**. Ownership of equities by age of household head, 2022.

| | Individually Held Equities | | | All equities, including mutual and retirement funds | | |
|---|---|---|---|---|---|---|
| Age of Head of Household | Owning (% of HH's) | Conditional Median Amount (000's of $) | Conditional Mean Amount (000's of $) | Owning (% of HH's) | Conditional Median Amount (000's of $) | Conditional Mean Amount (000's of $) |
| 21-34 | 23 | 3 | 22 | 56 | 12 | 69 |
| 35-44 | 21 | 12 | 177 | 64 | 30 | 195 |
| 45-54 | 23 | 11 | 235 | 63 | 69 | 375 |
| 55-64 | 19 | 30 | 569 | 59 | 111 | 740 |
| 65-75 | 20 | 65 | 662 | 56 | 160 | 838 |
| 75+ | 19 | 100 | 1,147 | 49 | 120 | 1,005 |

Note. Median and mean values are conditional on owning a positive amount and are denominated in 2022 dollars.
Source: Survey of Consumer Finances 2022 and authors' calculations.

# Conclusions

- Older workers are less likely to make career changes and labor market adjustments
- Conditional on education, a higher share of current older workers is employed in HEHC occupations, and these jobs have many old age-friendly features
- But implications for future generations of older workers may depend on how they adapt throughout the period of AI-drive structural transformation
- A rise in equity income from AI could be particularly beneficial for older workers but with ambiguous implications for retirement ages

## Policies

- Encourage acquisition of required skills (fundamental skills vs AI literacy) both pre-emptively and to encourage transitions to growing jobs
- Safety nets to support those adversely affected
- These are general policies that can be specifically tailored to the needs of older workers

# Thank you!