

AI: Jobs, Wages and Risks

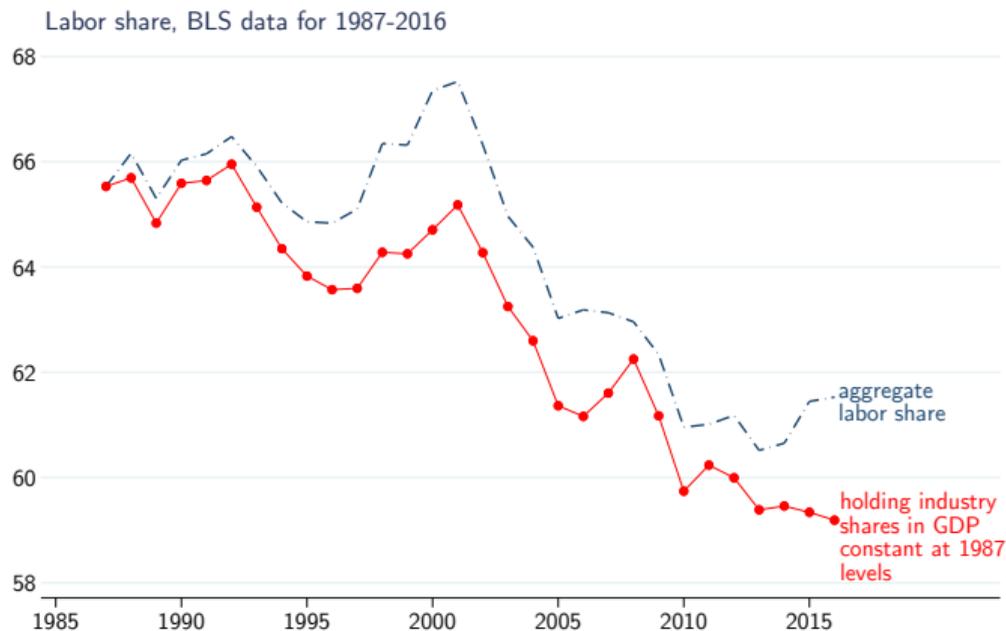
Daron Acemoglu

December 2022, European Systemic Risk Board

Hopes of AI

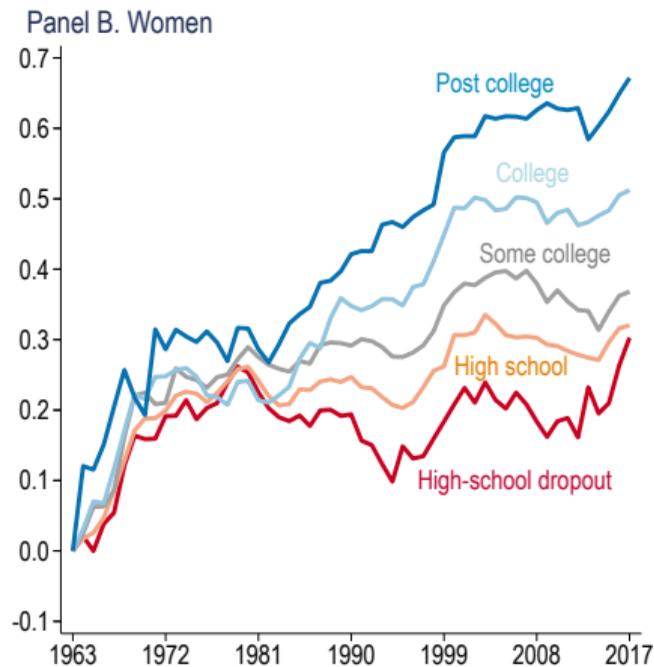
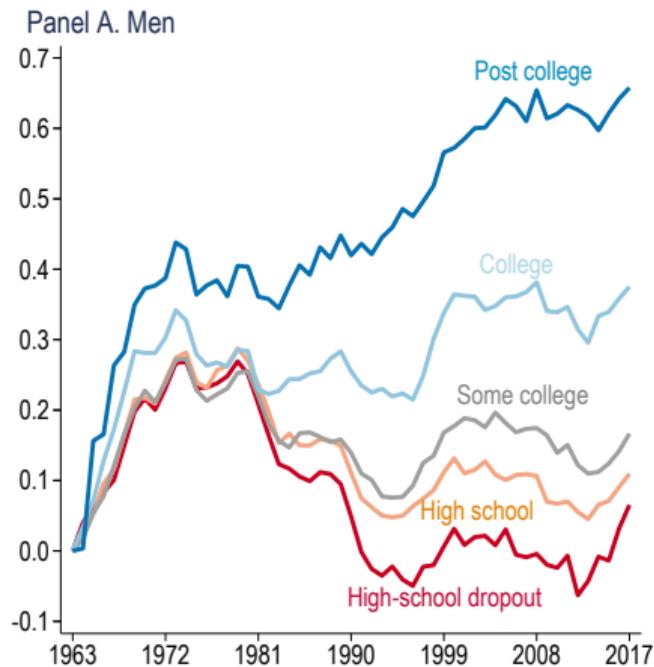
- ▶ Major advances in certain aspects of AI.
- ▶ Recent research showing that AI-related publications have shifted from the confines of computer science journals to a much broader range of application domains, indicating the onset of the more applied stage of the technology's advances.
- ▶ A lot of optimism. *The Economist*: fears of job losses from AI are exaggerated and *“by lowering costs of production, [AI-based] automation can create more demand for goods and services, boosting jobs that are hard to automate. The economy may need fewer checkout attendance at supermarkets, but more massage therapists.”*
- ▶ McKinsey-Davos statement for 2022 also dismisses fears of automation from AI: *“with Fourth Industrial Revolution technologies driving productivity and growth across manufacturing and production at brownfield and greenfield sites. These technologies are creating more and different jobs that are transforming manufacturing and helping to build fulfilling, rewarding, and sustainable careers.”*
- ▶ Broader benefits of AI are often emphasized as well, leading to better communication, tracking of risks and governance.

But Obviously Not All is Well, Even Before the Pandemic



- ▶ Declining labor share in the US; similar in Europe and the emerging world.
- ▶ Closely connected to automation.

Even More Concerning: US Wages

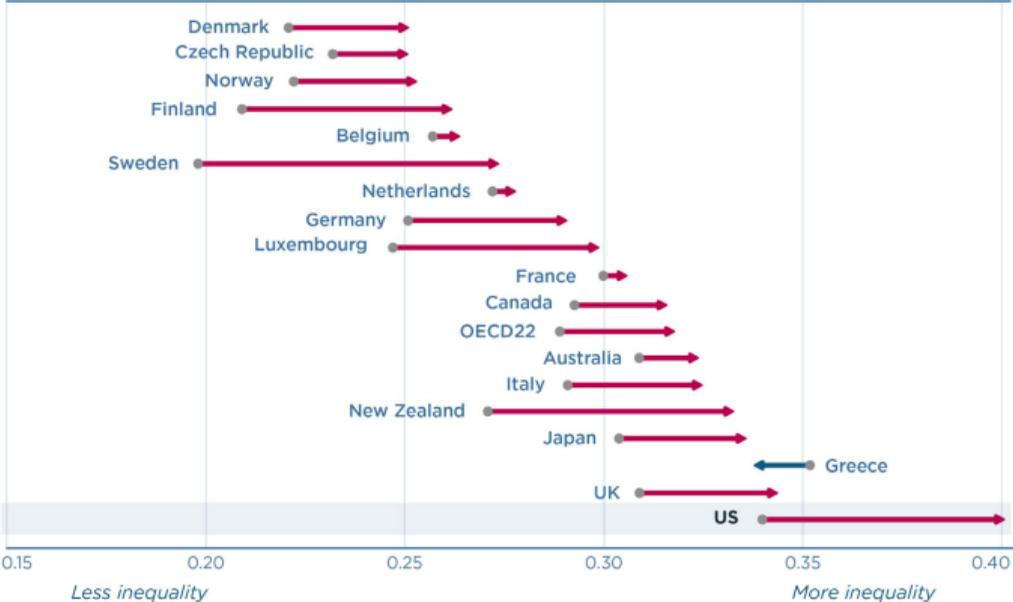


Source: Autor (AEA 2019)

- ▶ Huge increase in inequality, and significant declines in real wages for low-education groups.

Inequality Is Not Just a US Phenomenon, But It is Worse in the US

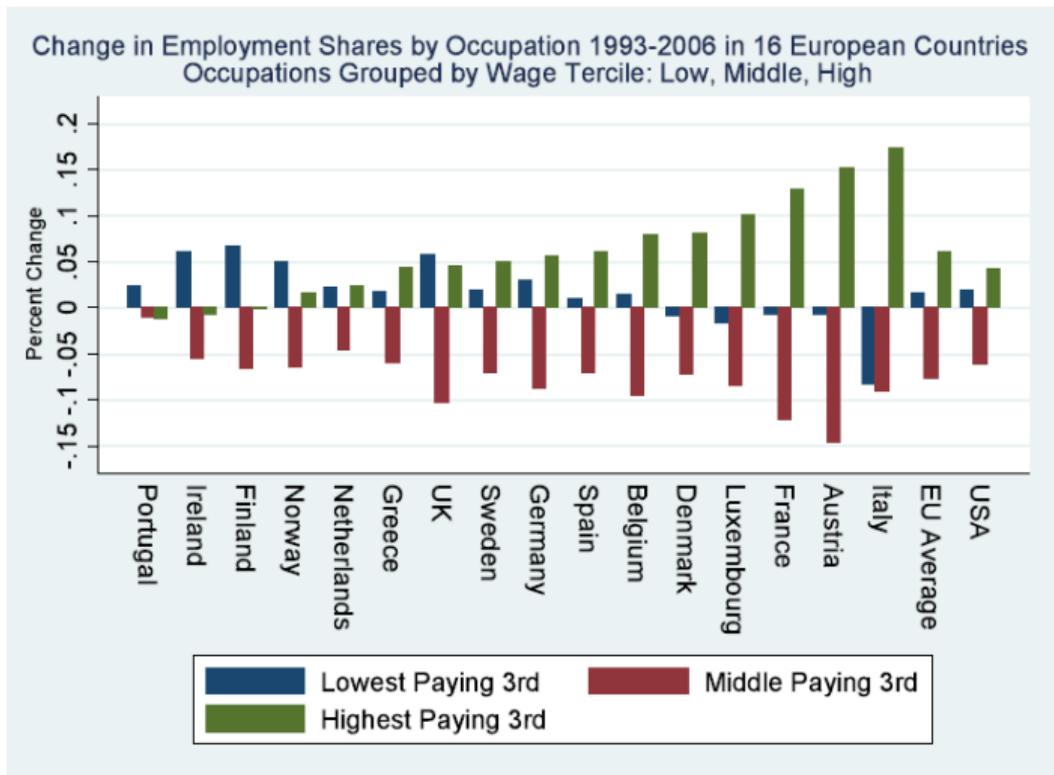
Figure 1: Change in Gini coefficient, 1985 to 2013



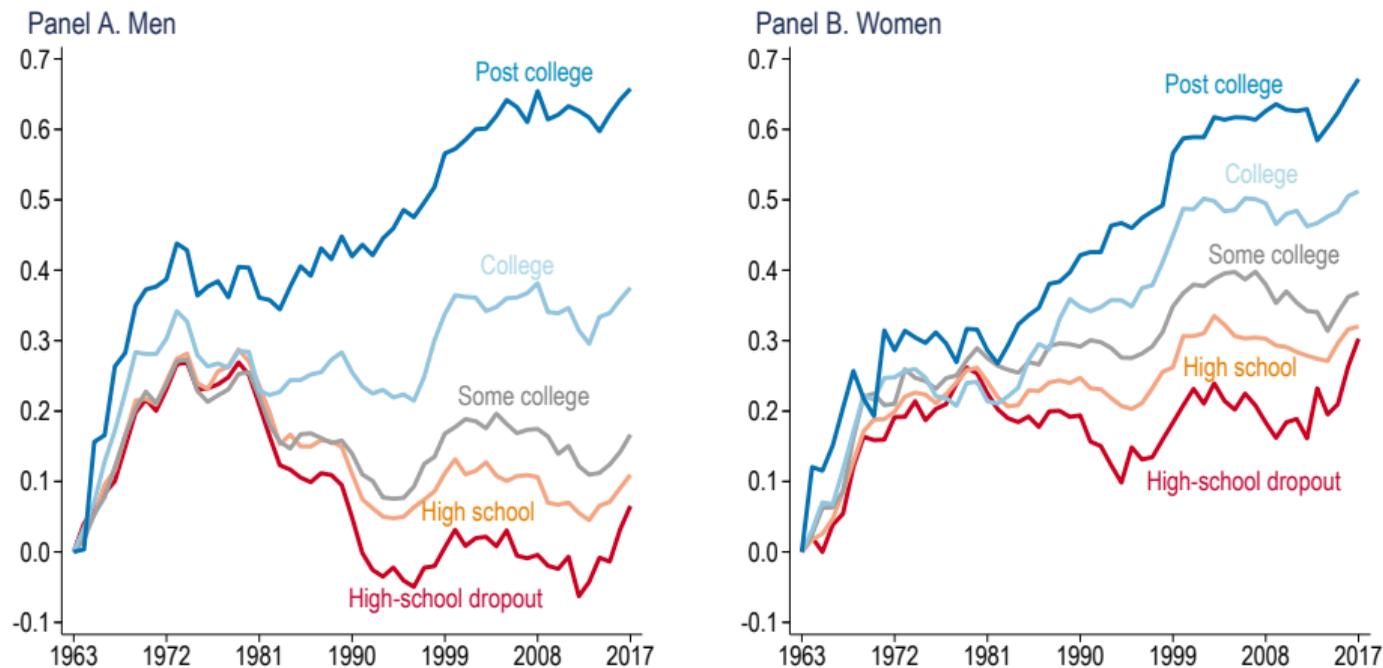
Note: 1985 data refer to 1985 or closest available year. 2013 data refer to 2013 or nearest available year. The Gini coefficient measures how equally income is distributed across a population, from 0 (perfectly equal) to 1 (all income to one person).

Automation is Not Just a US Phenomenon

- ▶ Similar polarization of employment— but not of wages, indicating an important role for labor market institutions.



But Obviously Not All is Well: US Wages

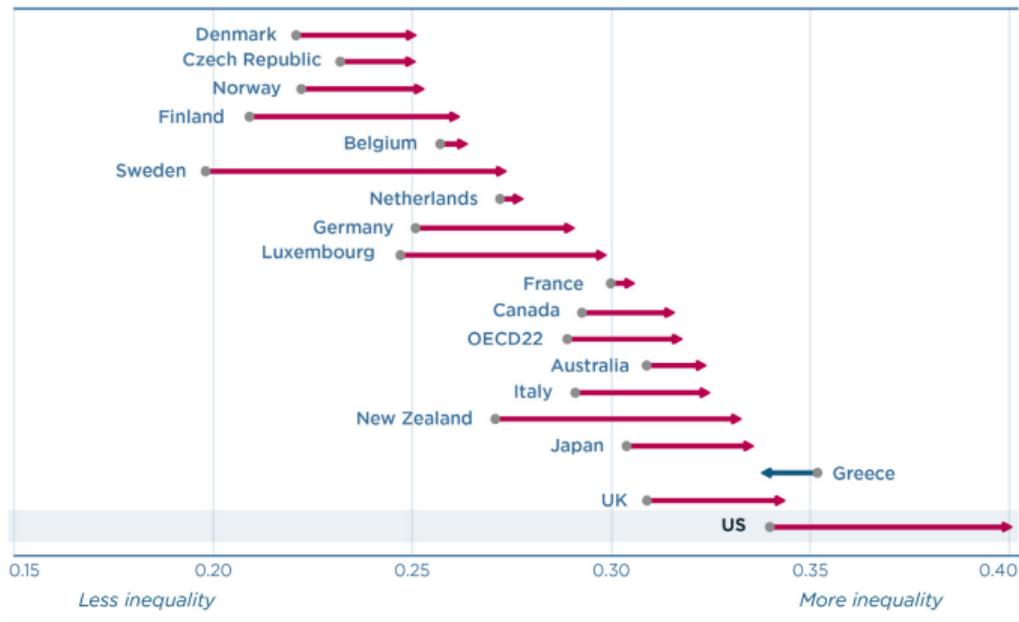


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Rise in Inequality Is Not Just a US Phenomenon

Figure 1: Change in Gini coefficient, 1985 to 2013

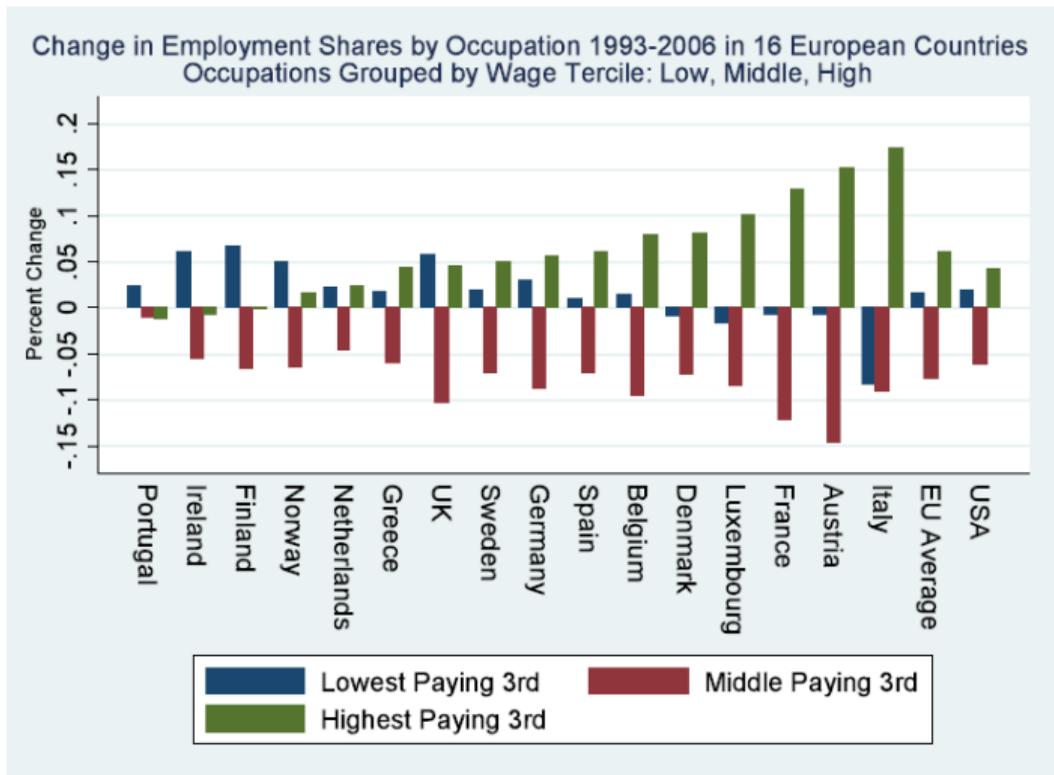


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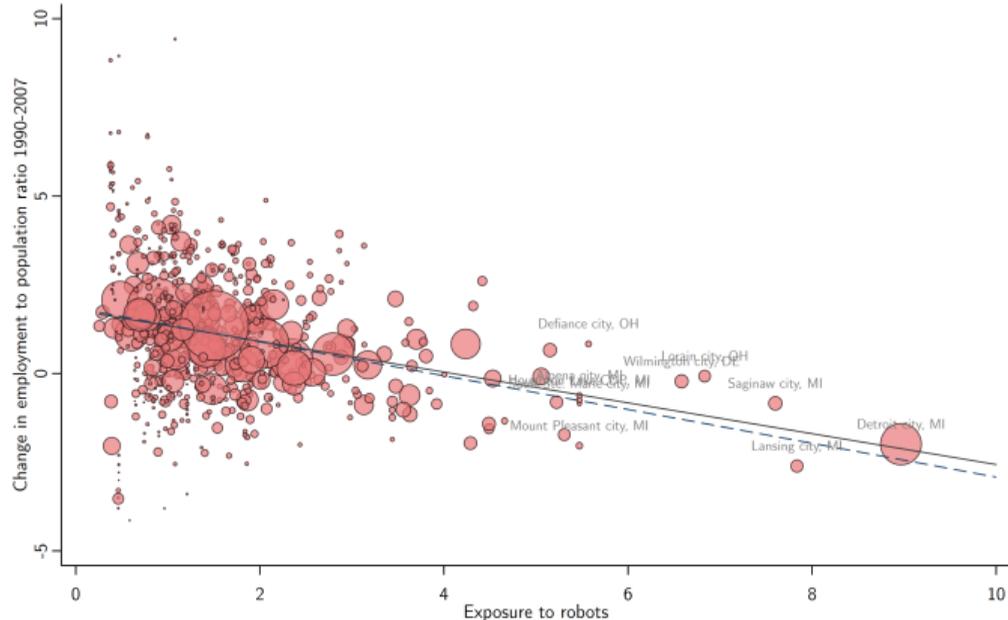
Source: Organization for Economic Cooperation and Development (OECD), "In It Together: Why Less Inequality Benefits All."

Automation is Not Just a US Phenomenon

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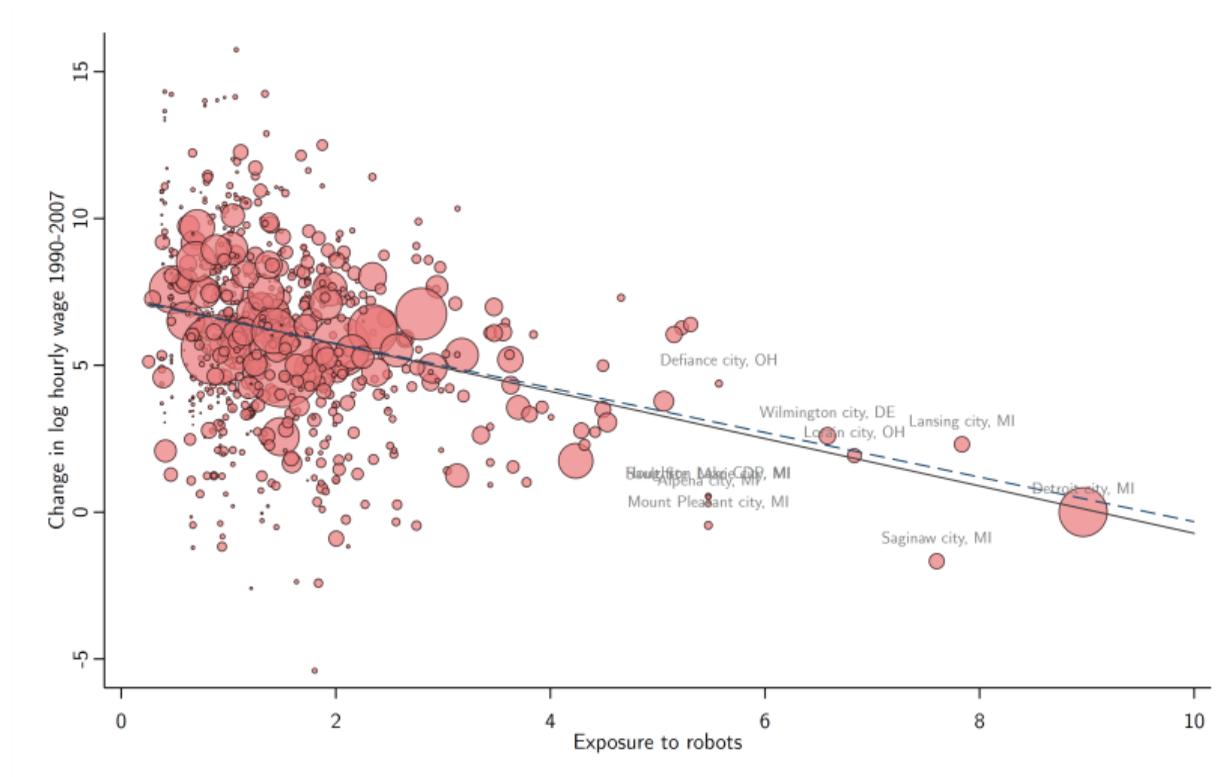


Pre-AI Automation and Local Employment



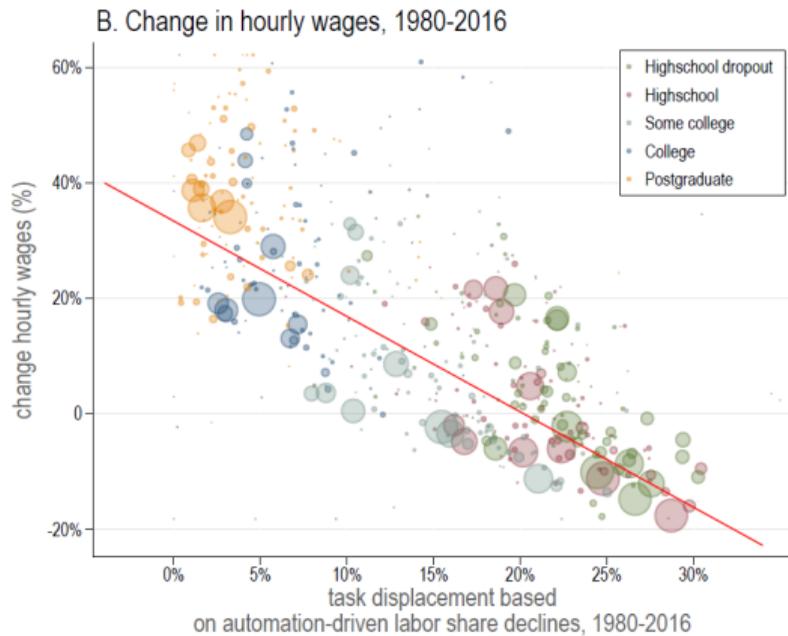
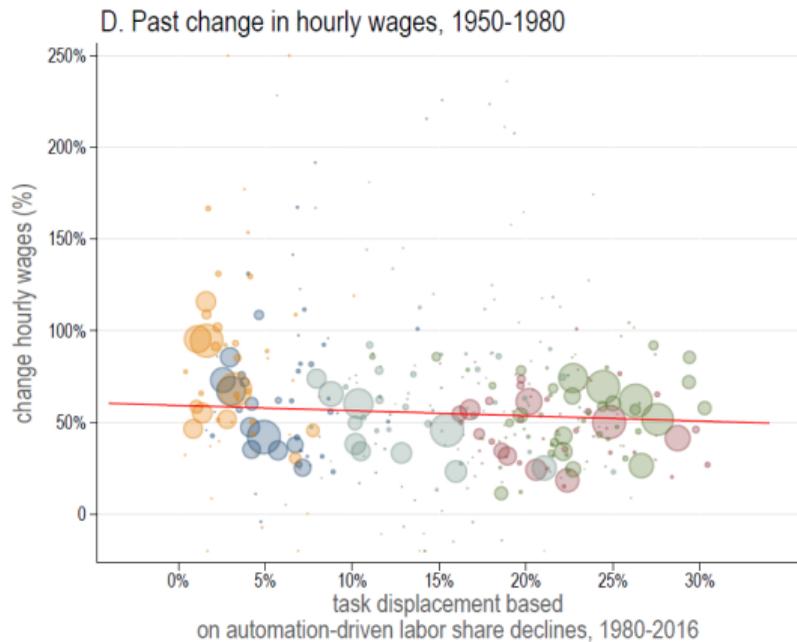
- ▶ Dashed line excludes the most exposed areas; thus the relationship is unchanged without the key parts of the industrial heartland.
- ▶ Major and very precise effects, but only a small part of national changes (because manufacturing is small).

Pre-AI Automation and Wages



► Dashed line excludes the most exposed areas.

Pre-AI Automation and Inequality

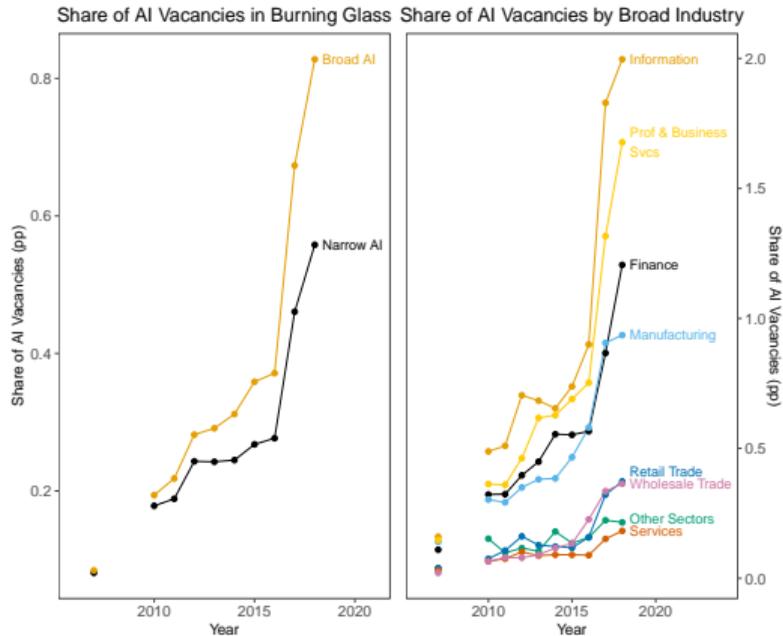


Source: Acemoglu and Restrepo (Emet 2020)

- ▶ Across 500 demographic groups (distinguished by education, gender, age, ethnicity and foreign/domestic), **task displacement** from 1980 onwards explains between 50-70% of all wage structure changes from 1980 to 2016. No pretrends before 1980.

AI is (Almost) Here

- ▶ Measure AI from its footprints in job postings.
- ▶ Huge increase in AI since 2015, across most sectors of the economy.



Source: Acemoglu, Autor, Hazell and Restrepo (J. of Labor Econ. 2022)

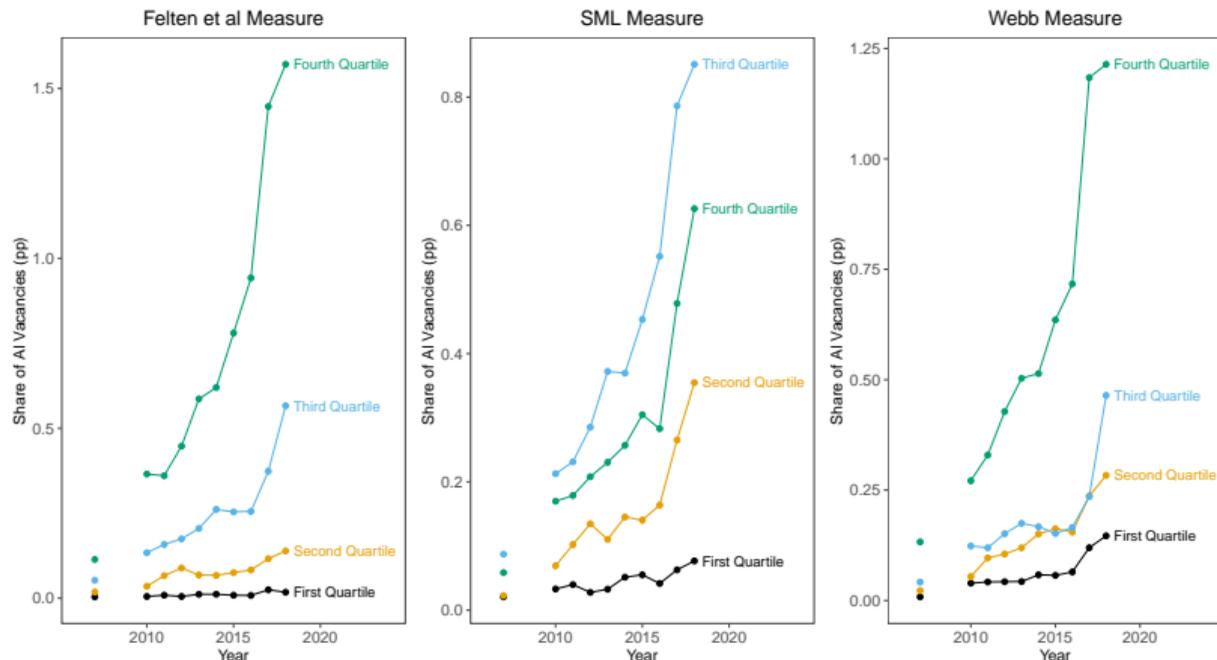
- ▶ Narrow AI vacancies up from 0.1% to 0.6%.

AI Direction: Need for New Tasks

- ▶ AI need not be used for automation.
- ▶ Machine intelligence is a broad technological platform that can be used for many purposes, including for creating **new tasks**, complementing humans, facilitating trade and matchmaking, and reorganizing production.
- ▶ Norbert Wiener, Douglas Engelbart and JCR Licklider in the 1950s and 60s advocated machine intelligence to complement human abilities, or “human-machine symbiosis”.
- ▶ Significant progress in this direction over the last six decades, some of it leading to huge breakthroughs in computer technology, including the mouse, graphic user interface, hyperlinks and the World Wide Web, etc.
- ▶ Also significant new platforms enabled by AI, such as Airbnb and ride-sharing apps.
- ▶ However, much of recent AI activity is focused on automation.

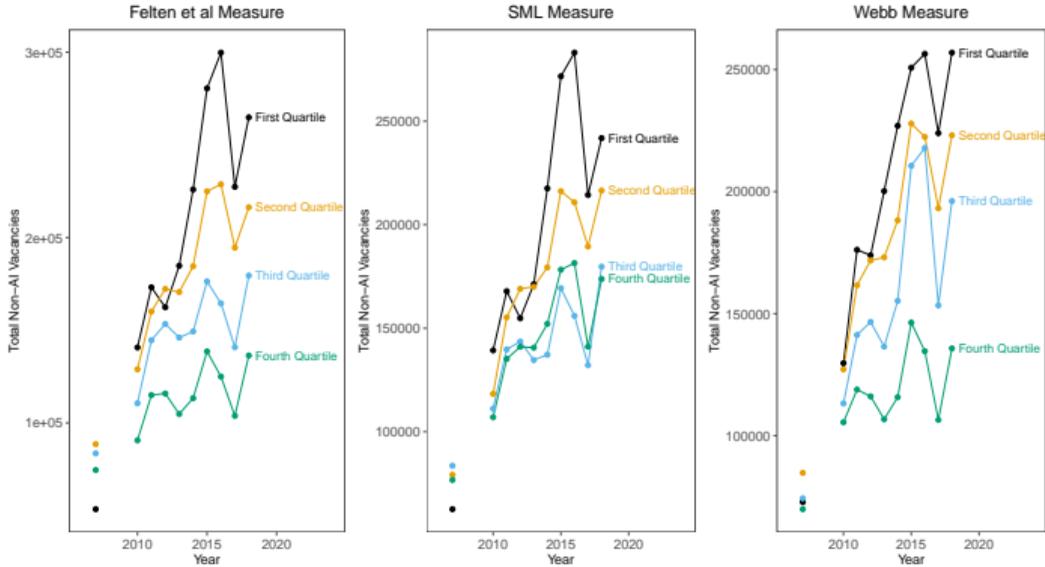
Establishment Share of AI Vacancies by Quartile of AI Exposure

- ▶ AI surge driven by establishments with more AI-replaceable tasks.



Source: Acemoglu, Autor, Hazell and Restrepo (J. of Labor Econ. 2022)

AI Negatively Associated with Establishment Hiring



Source: Acemoglu, Autor, Hazell and Restrepo (J. of Labor Econ. 2022)

- ▶ This pattern is robust and quantitatively large: AI adoption, at the moment, going hand-in-hand with reduce hiring.

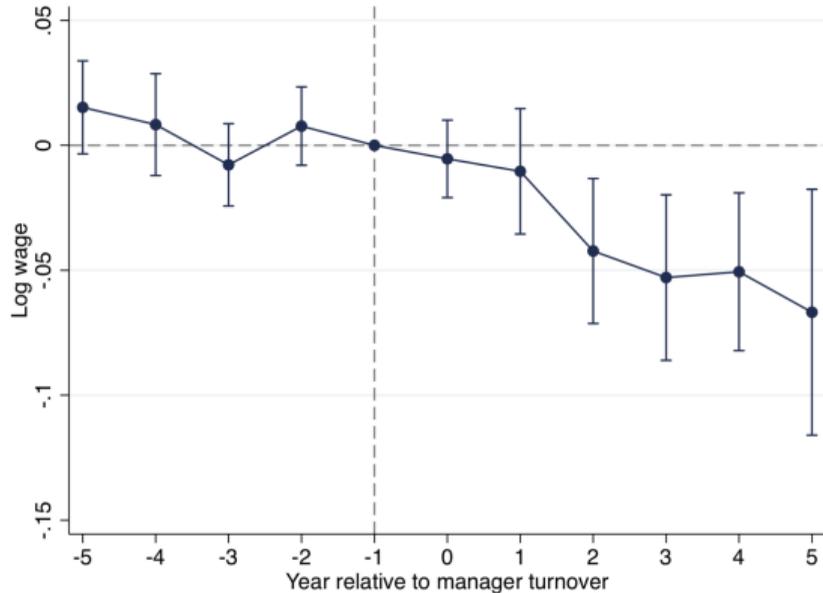
Why This Direction of Technology?

1. Business models and growing size of Big Tech.
2. Excessive focus on cost-cutting.
3. Changing nature of government support for research (working much more to support established corporate priorities).
4. The US tax code favors capital and powerfully encourages excessive automation.

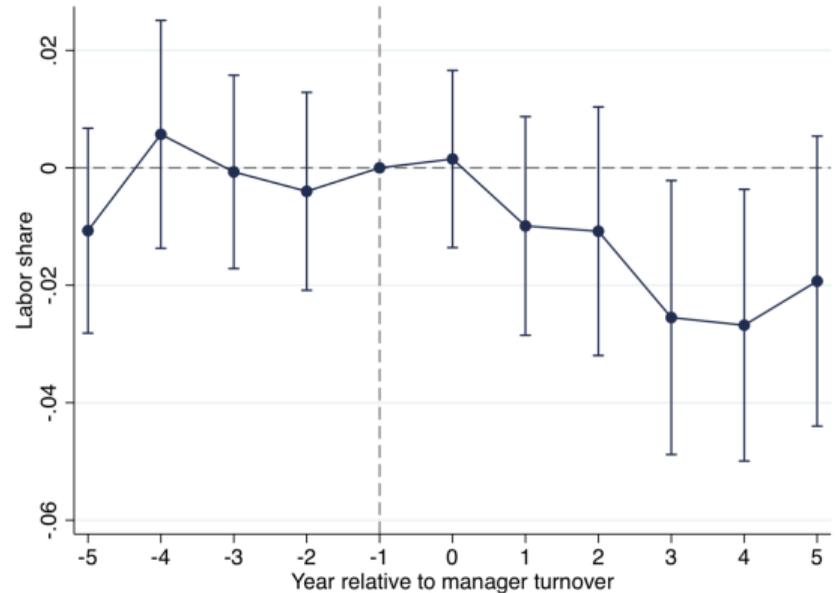


5. Priorities and focus of AI researchers.

Role of Cost-Cutting Ideology: Effects of MBA CEOs



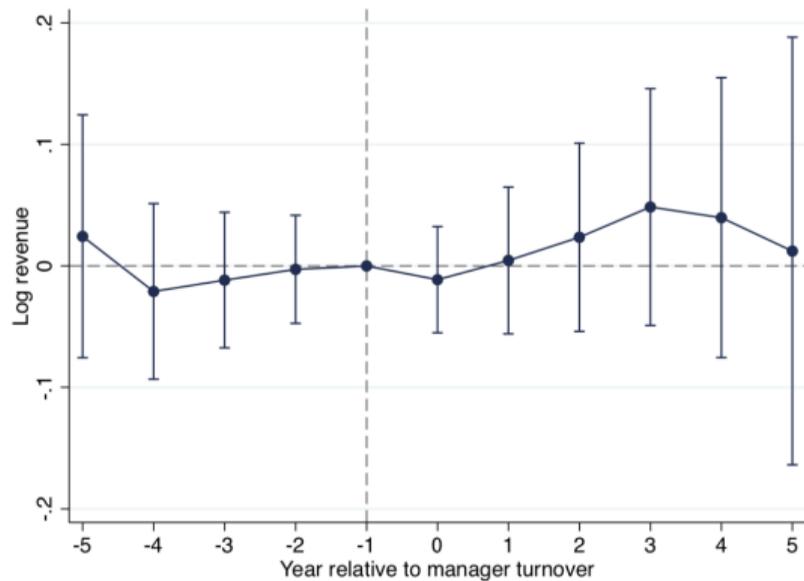
(a) Wage



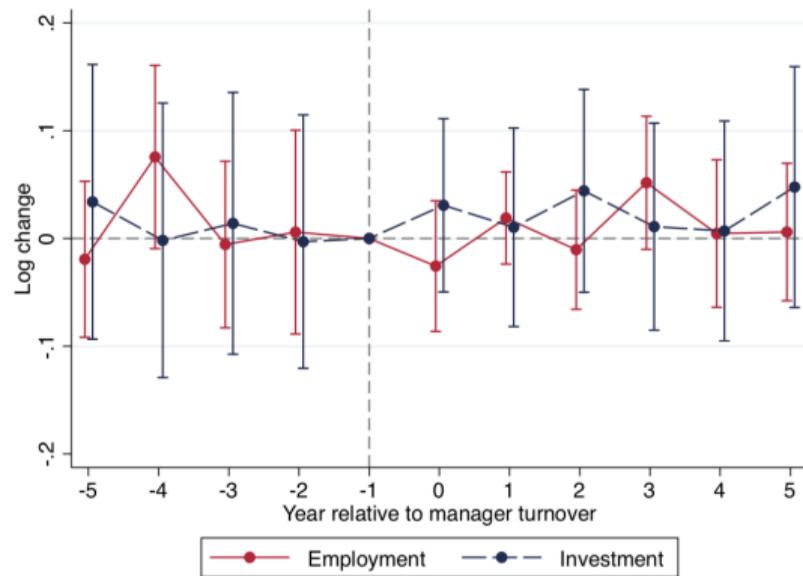
(b) Labor Share

- ▶ The average wage is lower by 6.7% and the labor share (in sales) by 1.8 percentage points five years after the appointment of a business manager. This explains about 20% of the decline in the labor share and slowdown of wage growth.

MBA CEOs Are Not More Productive



(c) Output

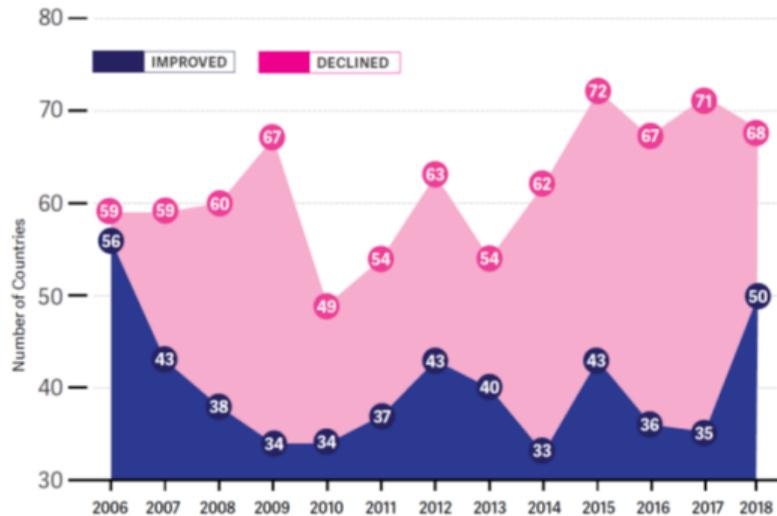


(d) Employment and Investment

Even Bigger Risks: Democracy

- ▶ Growing inequality and an increasingly two-tiered society created by automation is a huge risk.
- ▶ But there are others: bfdemocracy. Particularly important when we need a course correction.

Countries with net declines in aggregate score have outnumbered those with gains for the past 13 years.



Democracy Troubles

- ▶ Democracy's woes have many causes, but are not unrelated to technology.
- ▶ *Indirect*: Growing economic disparities, and the failure of democratic institutions to tackle them, have reduced support for democracy.
- ▶ *Direct*: The current direction of AI has damaged democracy:
 1. AI-powered surveillance technologies in the hands of nondemocratic governments and excessively powerful corporations.
 2. Pernicious effects of targeted ad-based business model on democratic discourse, via social media and other online platforms.
 3. Elitist attitudes of tech leaders:

I've become an expert on how to increase economic inequality, and I've spent the past decade working hard to do it. You can't prevent great variations in wealth without preventing people from getting rich, and you can't do that without preventing them from starting startups. Paul Graham.

Move fast and break things. Mark Zuckerberg.

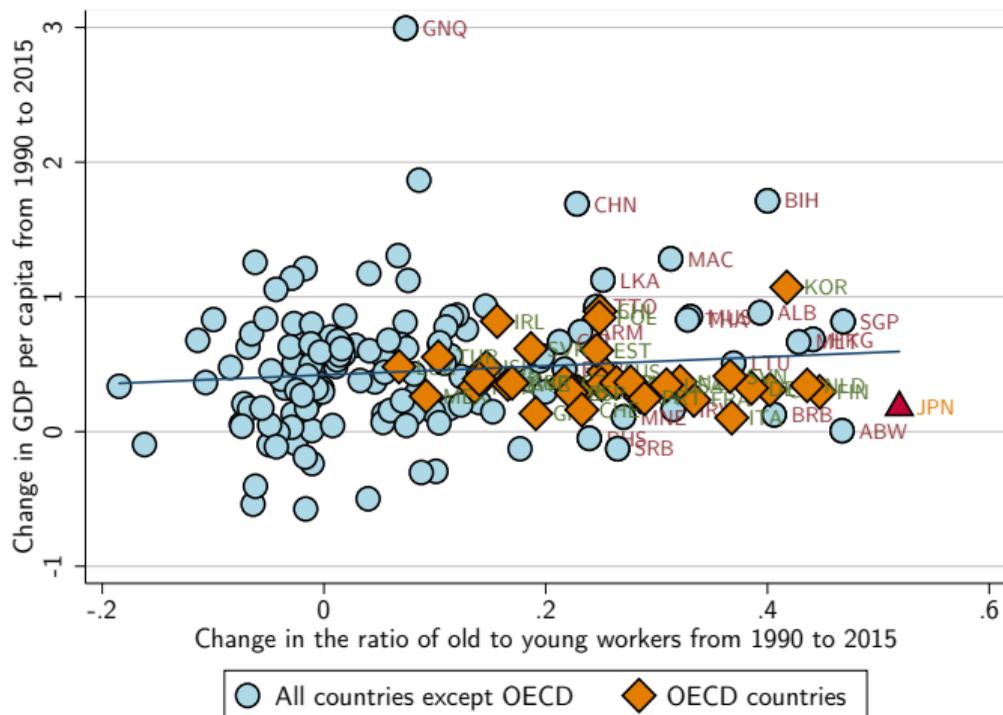
Perhaps it's only when a technology is fully integrated into daily life, and recedes into the background of our imagination, that people stop fearing it. Steve Vassallo, Silicon Valley venture capitalist.

Should We Fear AI?

- ▶ It depends.
- ▶ New technologies expand our capabilities, and if we use them well, they can be hugely beneficial.
- ▶ Moreover, many of the fears surrounding AI, such as those related to super-intelligent robots, are misplaced.
- ▶ But yes, there are reasons to be worried:
 - ▶ If new automation takes the form of more so-so automation, and especially excessive automation, and if it is not accompanied with new tasks, then it is bad news for workers and the economy.
- ▶ There are also examples in which automation has been a lifeline for some economies, especially because it has been associated with productivity increases, wage growth and new tasks.
- ▶ Leading example: automation in response to aging populations has been essential for countries such as Germany, Japan and South Korea.

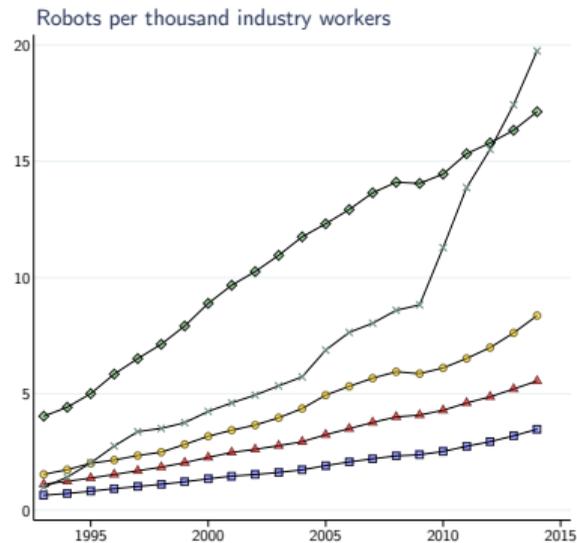
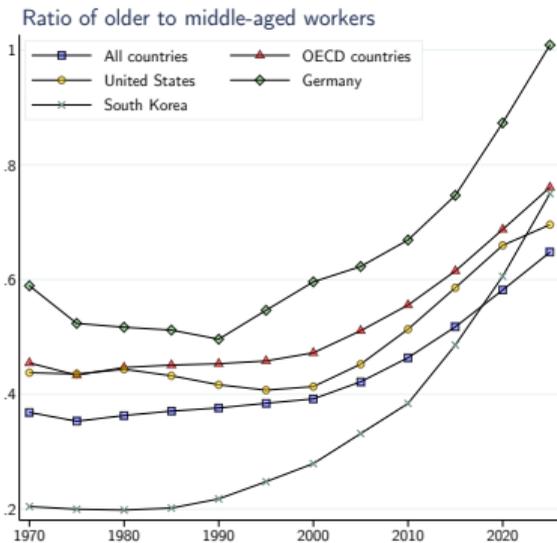
Costs of Demographic Change?

- ▶ Rapidly aging countries have not performed worse micro economically.

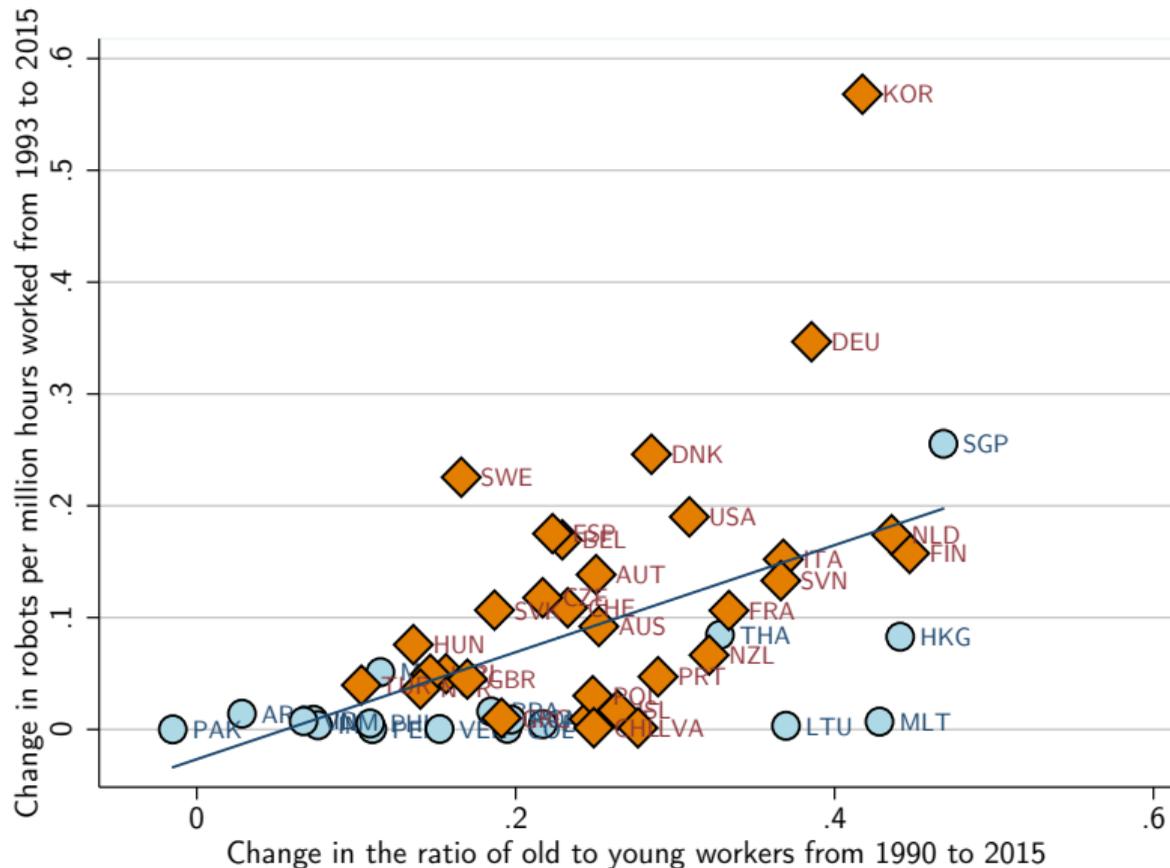


Why Not?

- ▶ Largely thanks to automation.



Not Just Confined to Germany and South Korea



Conclusion: Future of Work and Future of Democracy

- ▶ What matters in general and especially in the case of AI is the direction of technology.
- ▶ **Good automation** — high-productivity automation technology needs to be accompanied with **new tasks** — can contribute to productivity and labor demand.
- ▶ **Bad automation** tends to reduce employment growth and worsens the distribution of income — esp. when there is excessive automation due to policy or vision distortions.
- ▶ **Good communication technologies** — creating new public spheres, foundations for more decentralized action, and greater democratic responsibility.
- ▶ **Bad communication technologies** — facilitating surveillance, misinformation, emotional outrage and polarization.
- ▶ Which will it be?