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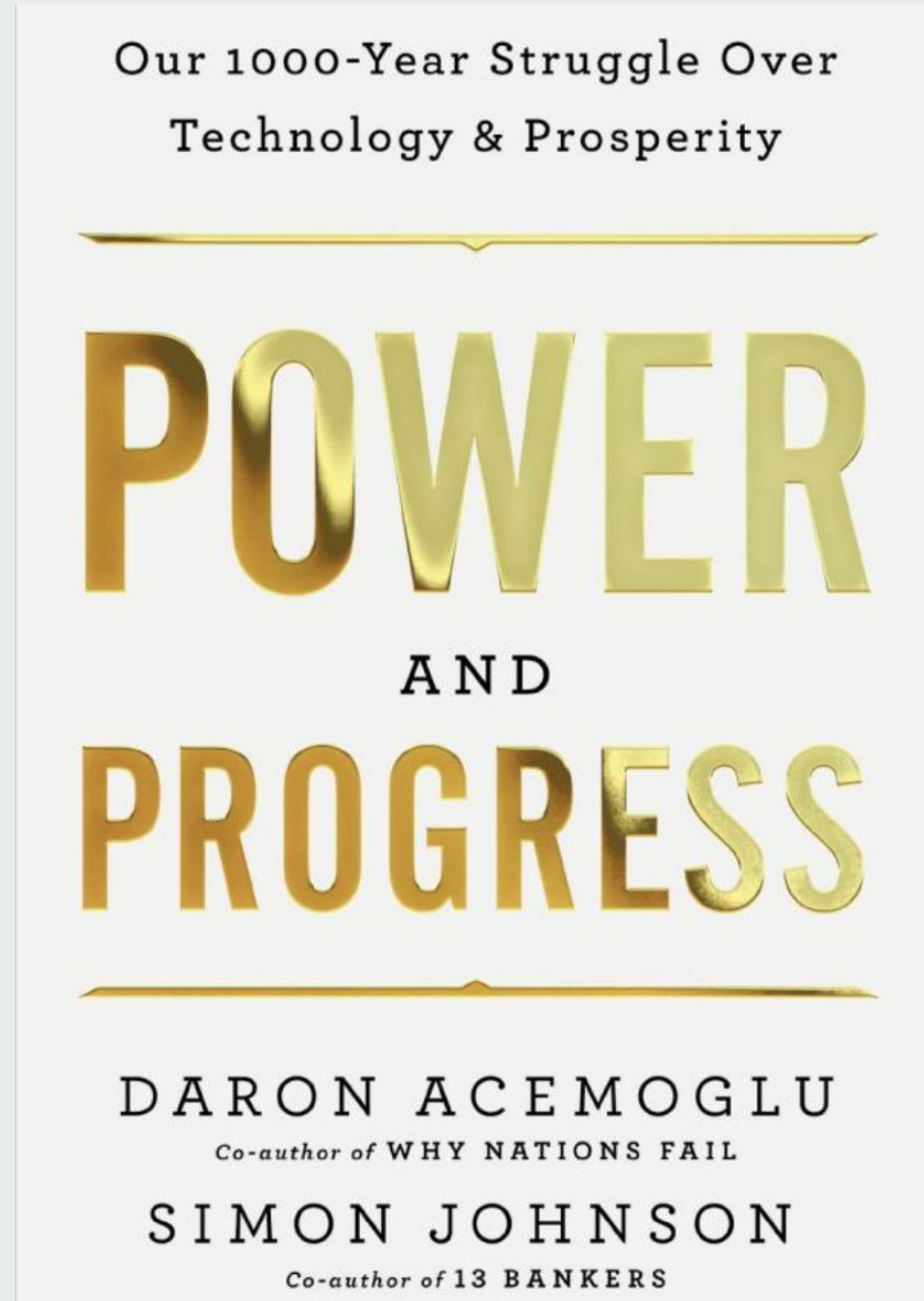
Power and Progress

Daron Acemoglu
MIT

13. June 2023



New Book



Progress/Productivity/R&D – in what?

- Aggregate Production Function

- $Y = A F_Z(z_L L, z_K K)$

TFP labor capital
 productivity

Does labor productivity z_L increase
lead to less more labor demand?

Depends on elasticity of substitution

Shared prosperity
Marx's error

cost-cutting

Progress/Productivity/R&D – in what?

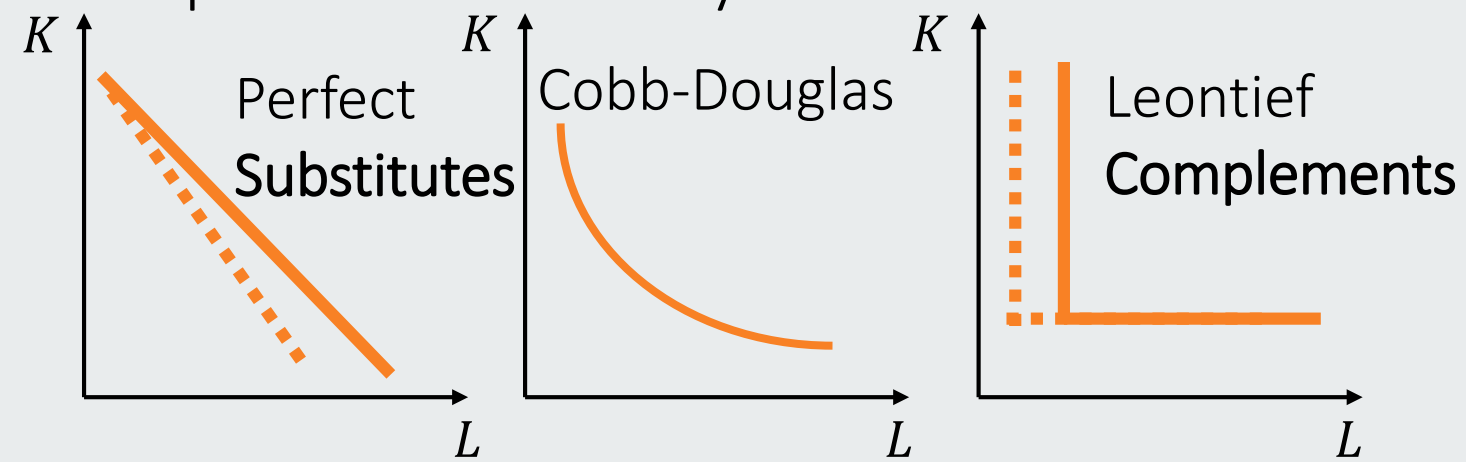
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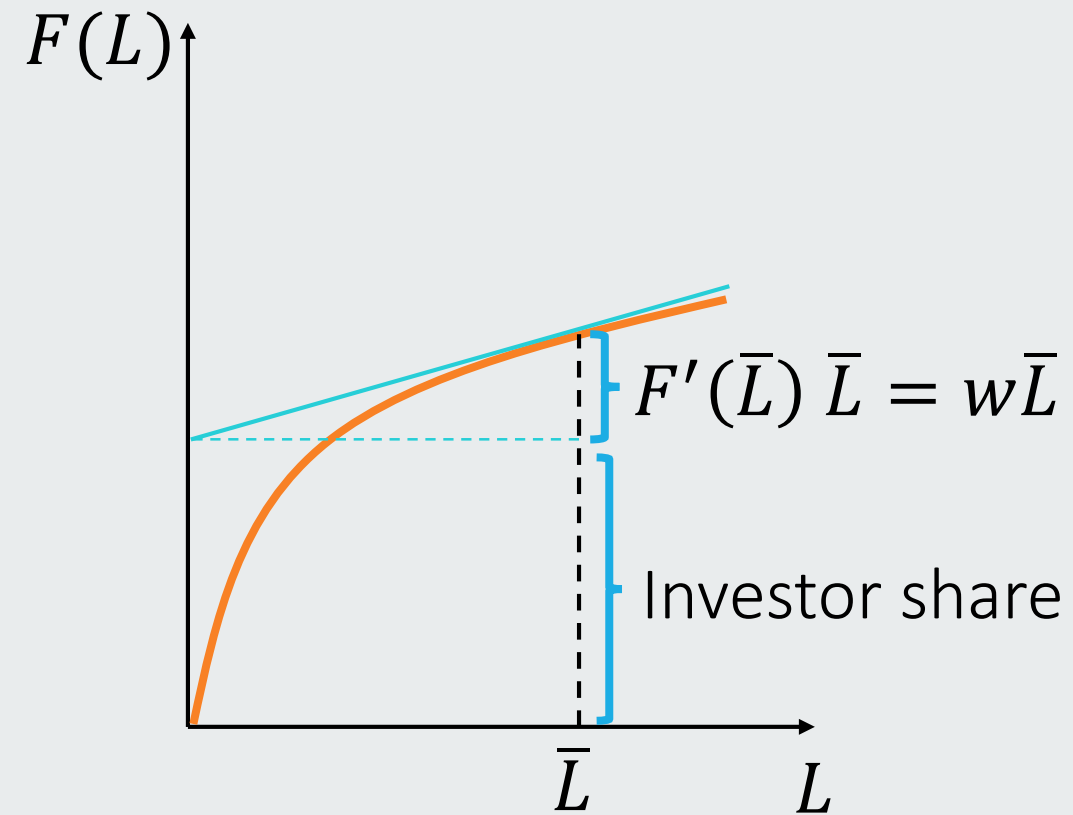


Shared prosperity
Marx's error

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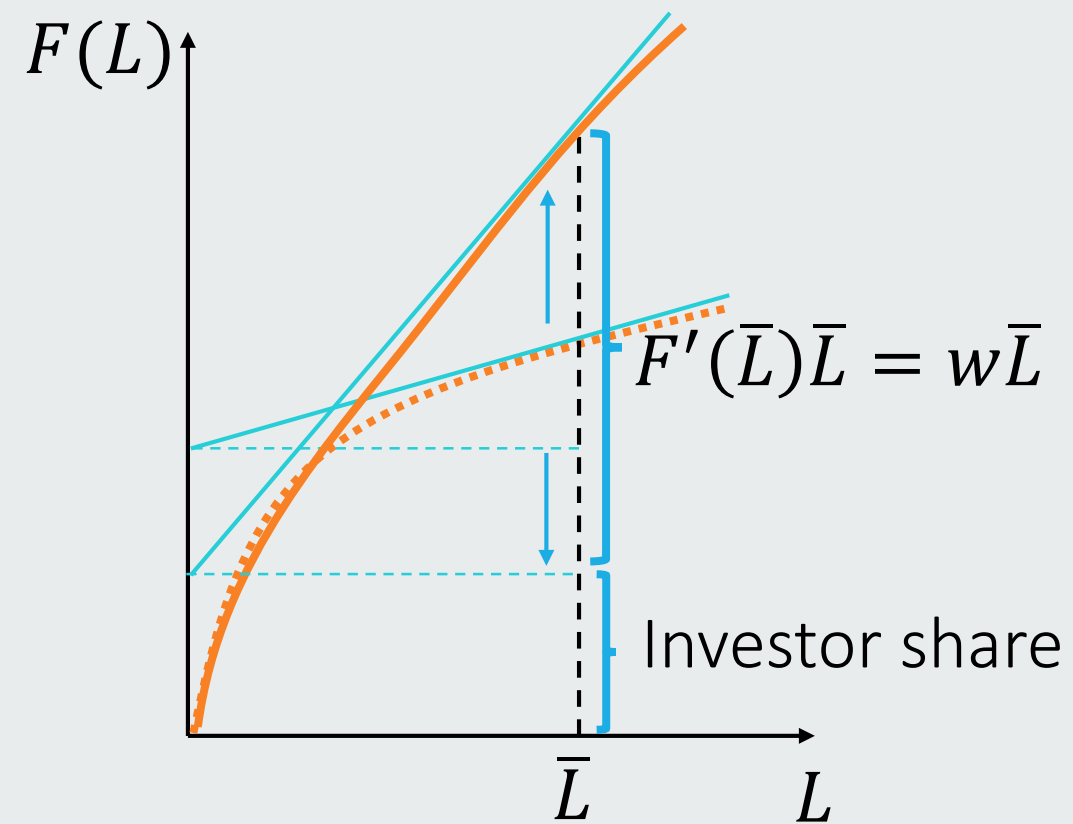
Progress/Productivity/R&D – in what?

- Average vs. marginal
 - Wage = marginal productivity



Progress/Productivity/R&D – in what?

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In what? Household production function

- iPhone
- YouTube

- Efficiency gains by
 - enabling self-repairs etc.
 - Better matching for movies/vacation

Direction of Progress – who decides?

- Who decides?
 - DARPA Government (Military)
 - Jet engine, internet, computer chip, telecom...
 - Steve Jobs, Elon Musk, Sam Altman, ...
 - Ugur Sahin + Özlem Türeci (immigrants to Germany)
mRNA vaccines
 - Capital markets:
 - VC ecosystem vs. large firms
- Health and Drug development
 - Malaria vs. viagra?
- Stage: Innovation vs. implementation

Speed of Change and Resilience

- Slow down: does extra time to react
 - lead to bounce back or
 - adverse feedback loop?
- Does slowing down help the malicious actors to catch up?

Poll

1. There are strong, **automatic forces** that **ensure** that **most people** will **ultimately benefit** from technological progress that expand our productive and social capabilities.
 - a. True
 - b. Maybe
 - c. False
2. (Generative) **AI** is going in a **direction** that will **spearhead important advances**.
 - a. True
 - b. Maybe
 - c. False
3. The main **problem** in the **tech industry** right now is **bad regulation** that is **slowing down** the pace of advances. Lighter regulation would enable faster improvements that would be broadly beneficial.
 - a. True
 - b. Maybe
 - c. False

POWER AND PROGRESS

*Our 1000-Year Struggle Over
Technology & Prosperity*

DARON ACEMOGLU
&
SIMON JOHNSON



In the age of breathtaking advances in Artificial Intelligence...

*Who controls the future?
Who benefits?*

With advances in “machine intelligence,” we must consider how new technologies will serve society.

Will generative AI serve only a technological elite or underpin broad-based prosperity?



We have been here before: Visionaries and hubris

Ferdinand de Lesseps was lauded for his great success, the Suez Canal.

Expecting similar success, he pushed his vision for a new canal in Panama, with catastrophic consequences.



Ferdinand de Lesseps:
the canal digger at Suez



Costs of Lesseps's hubris:
22,000 dead at Panama

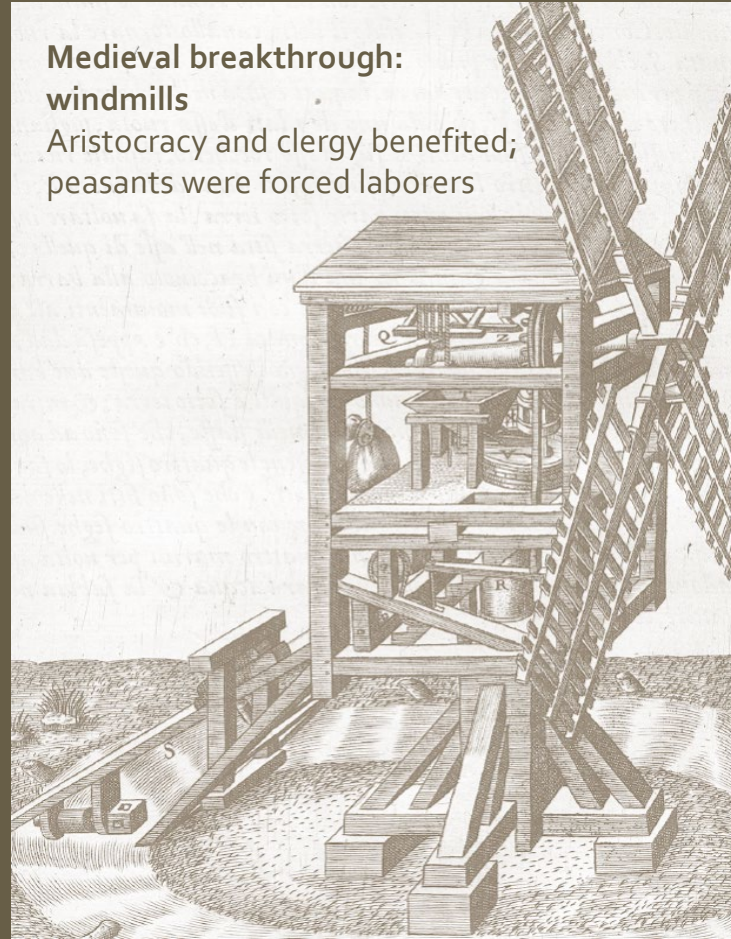
TECHNOLOGY
IMPROVES

PRODUCTIVITY
RISES

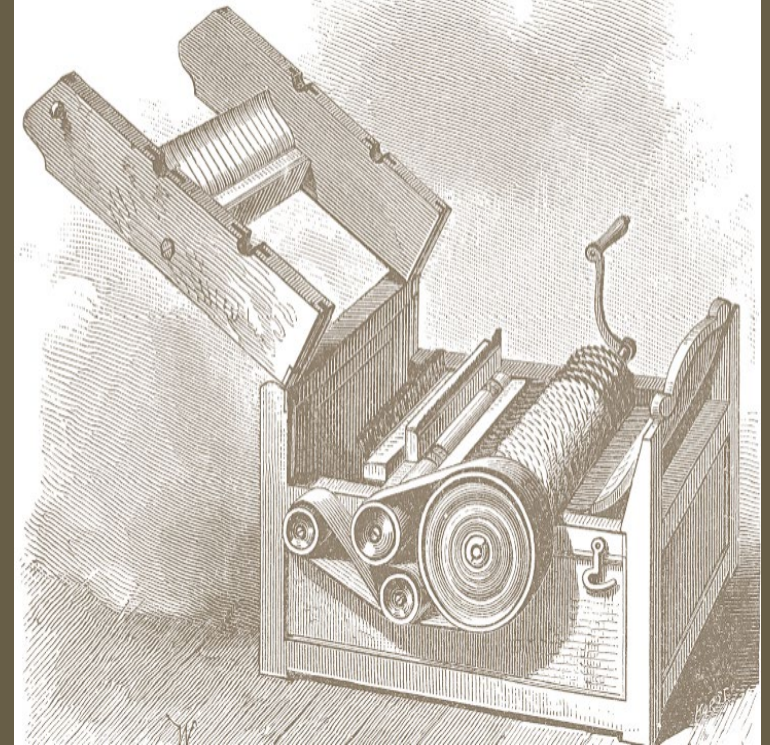
WORKERS
ALSO BENEFIT

The productivity bandwagon: do workers benefit?

**Medieval breakthrough:
windmills**
Aristocracy and clergy benefited;
peasants were forced laborers



Eli Whitney's cotton gin, 1794
Enslavers benefited; slavery
intensified in the deep South



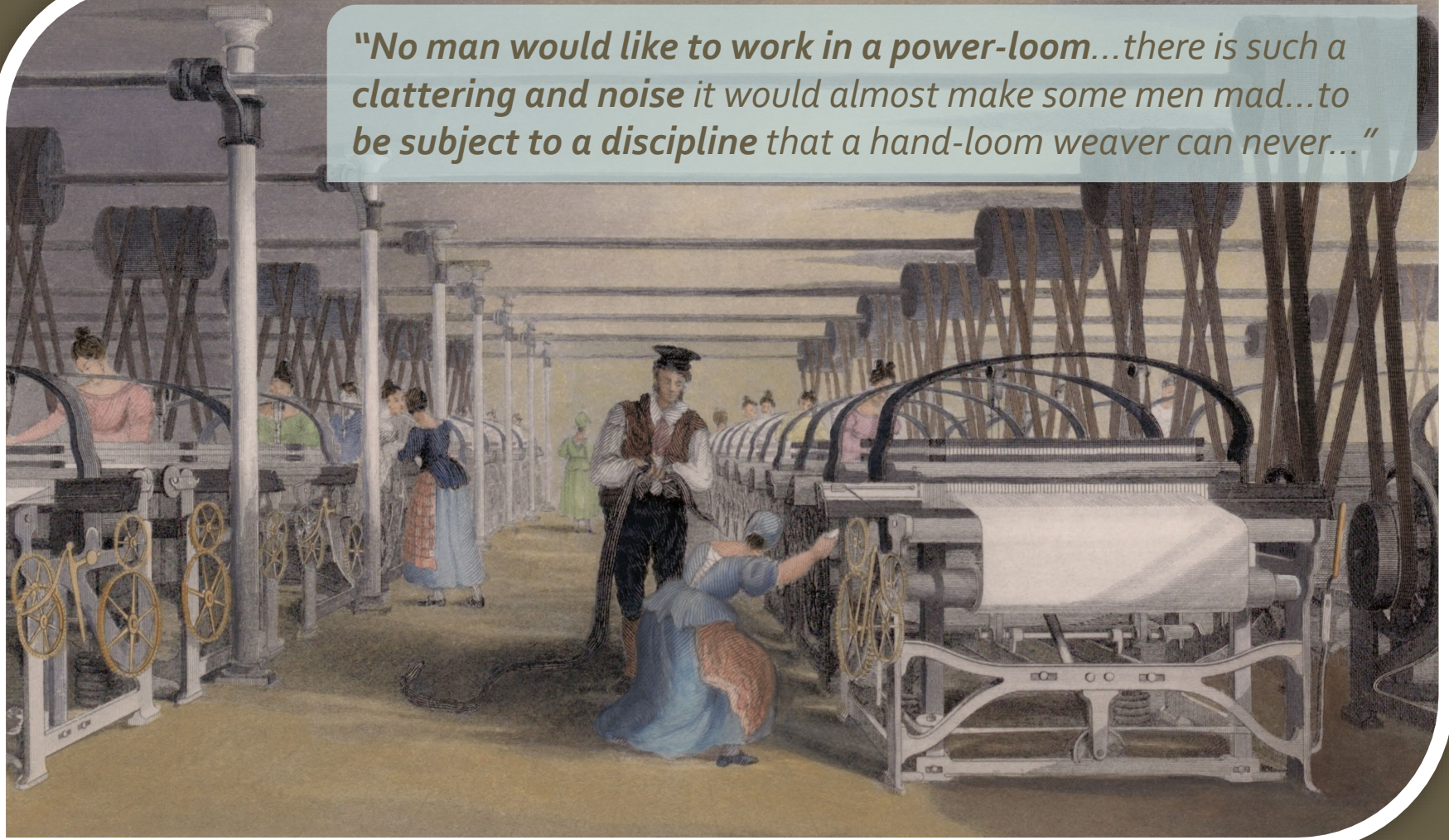
The Industrial Revolution: Automation blues

In the nineteenth century, power looms automated the work of hand-weavers.

Working conditions worsened, wages were low, and surveillance was intense.

Automation displaced workers, and without the creation of new tasks for them, the productivity bandwagon ground to a halt.

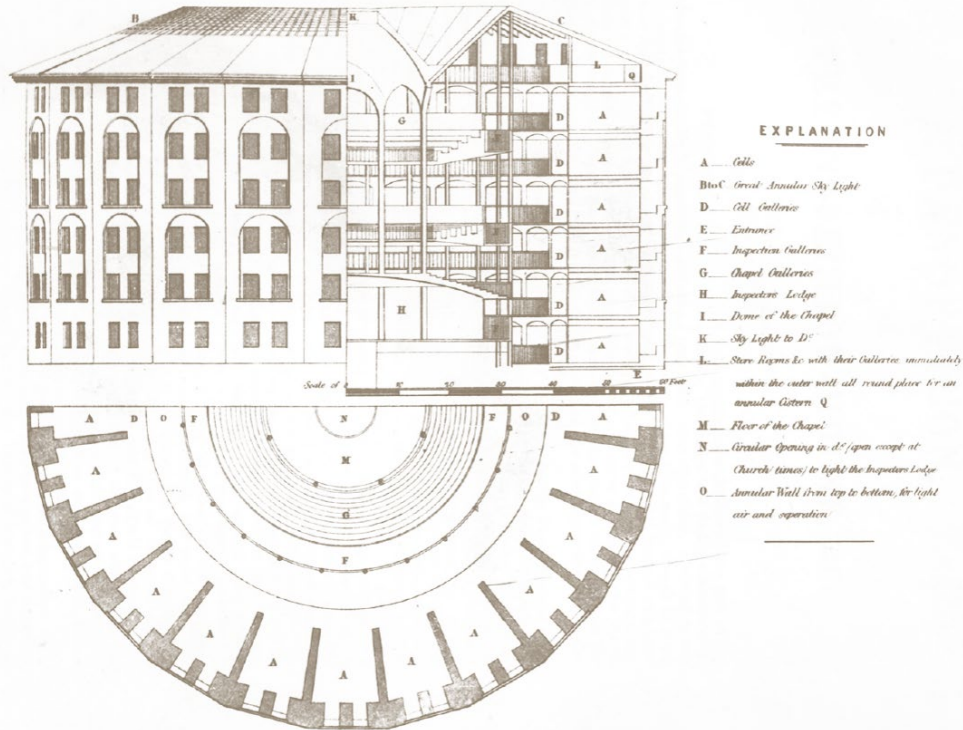
"No man would like to work in a power-loom...there is such a clattering and noise it would almost make some men mad...to be subject to a discipline that a hand-loom weaver can never..."



The Industrial Revolution: Worker monitoring and worsening health

Surveillance technologies, inspired by the panopticon, enabled capital to squeeze labor.
As cities grew, disease and squalor abounded.

*A General Idea of a PENITENTIARY PANOPTICON in an Improved, but as yet, Unfinished State
See Postscript References to Plan, Elevation & Section, being Plate referred to as N° 2.*



DIPHTHERIA SCROFULA CHOLERA

FATHER THAMES INTRODUCES HIS OFFSPRING TO THE FAIR CITY OF LONDON

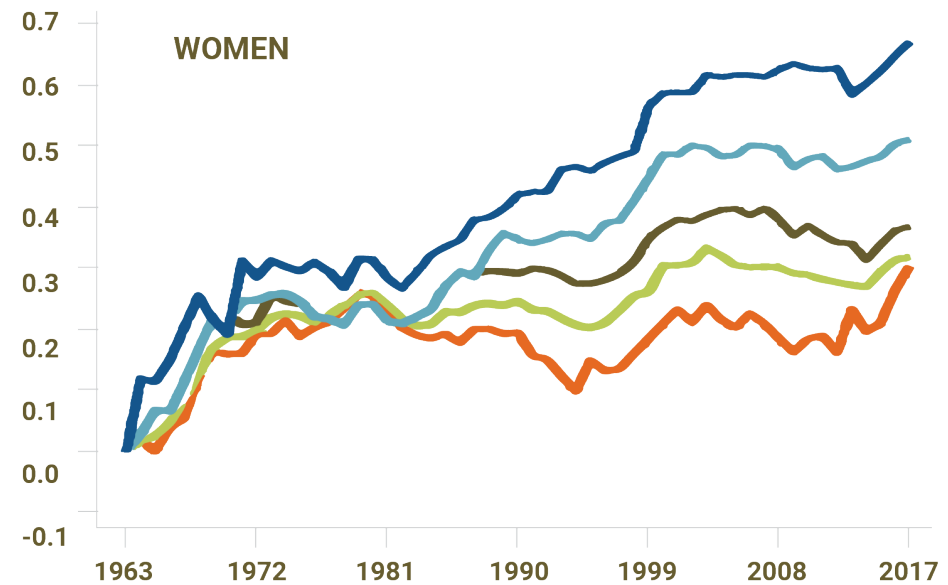
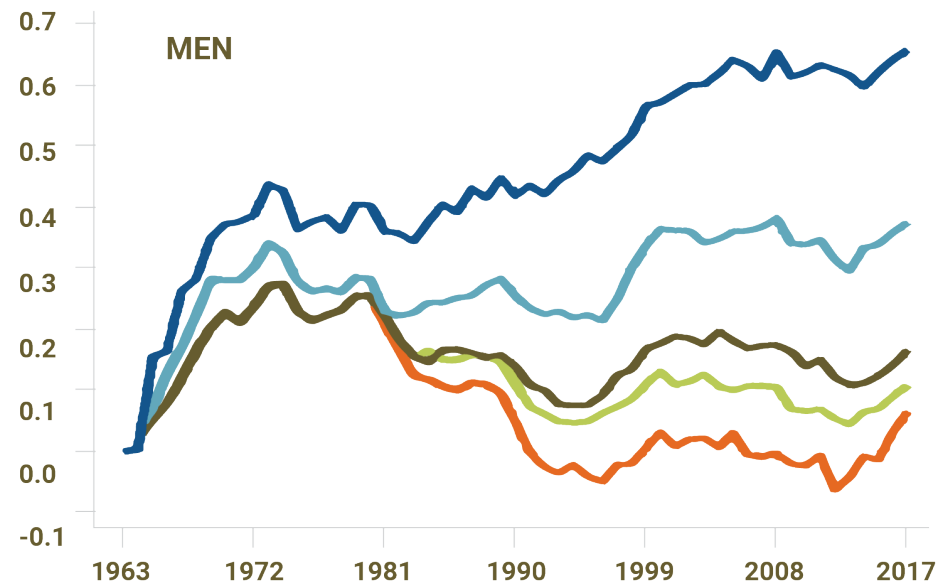
Worker monitoring: Jeremy Bentham's panopticon, 1791

City squalor: growth of industry worsened health, 1858

Modern times are different... right?

Shared growth and prosperity following WWII, but a growing divergence over the past 40 years

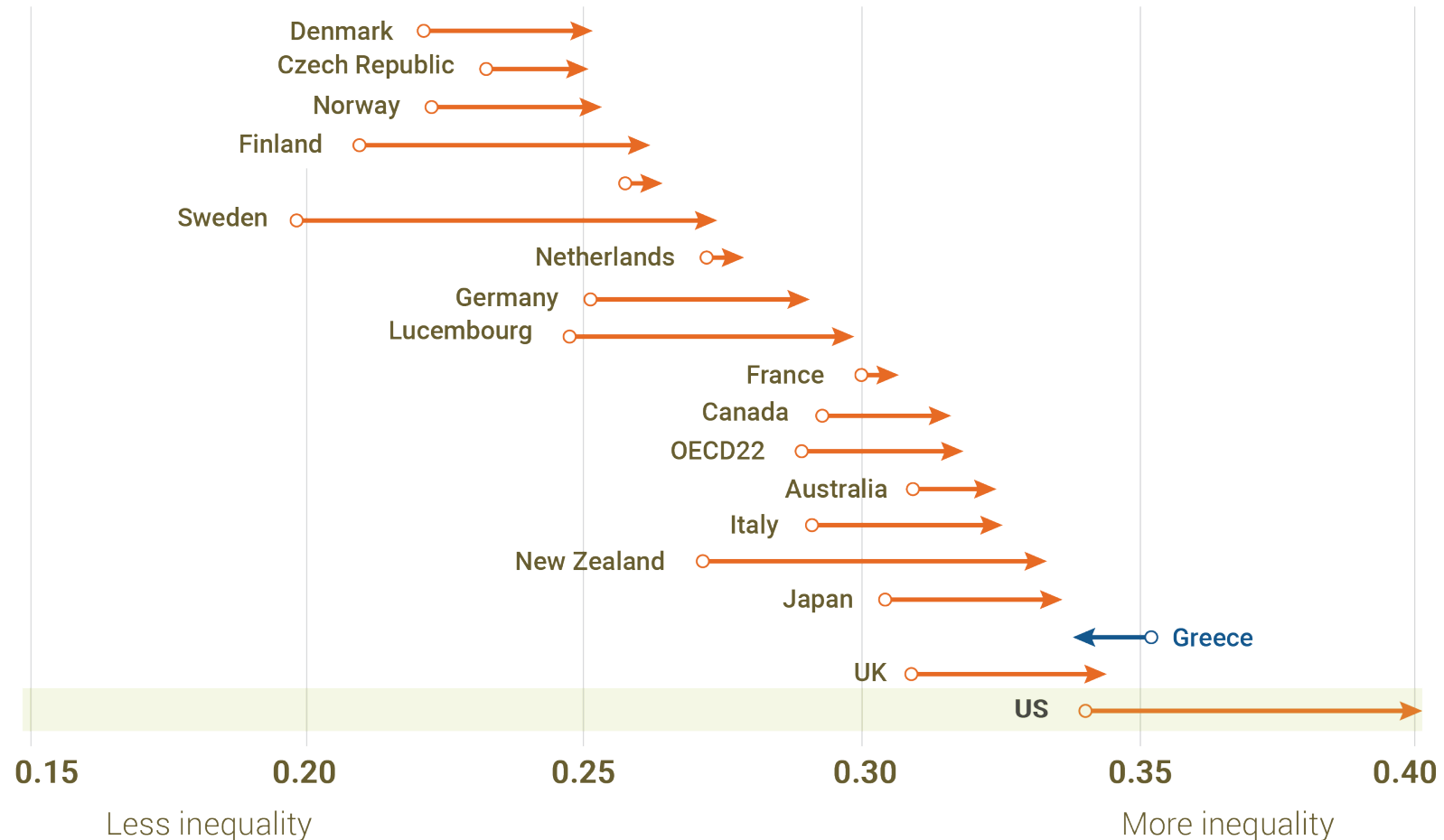
The change in real (log) weekly earnings, since 1963
Working age adults, ages 18–64



● High School dropout ● High School graduate ● Some College ● College degree ● Graduate degree

The rise in inequality is not just a US phenomenon.

Change in the Gini Coefficient, measure of inequality
1985–2010's



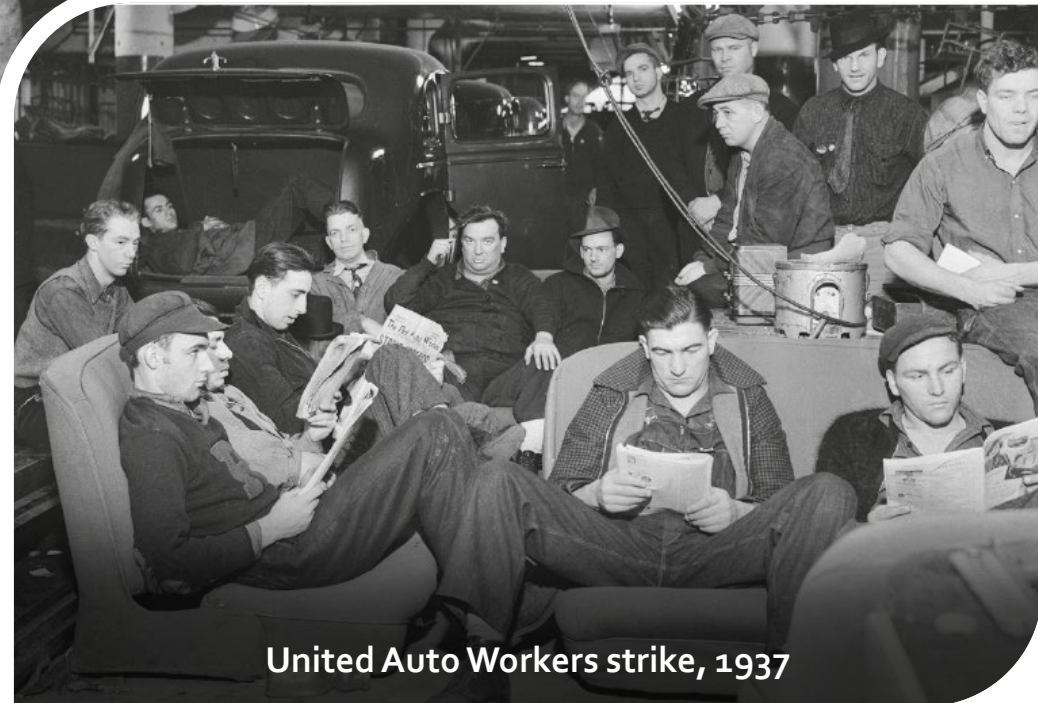
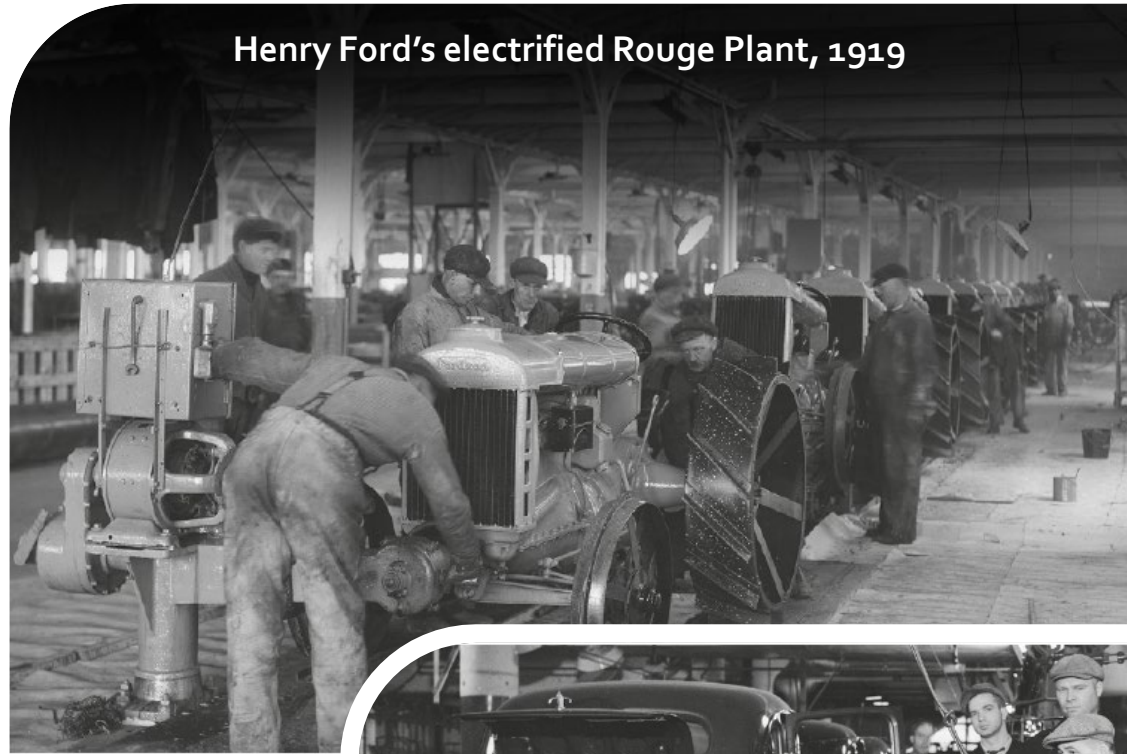
When does the “productivity bandwagon” deliver shared prosperity?

New tasks and worker power

Lessons from the U.S. automobile manufacturing industry:

- I. Electrification and the modern factory dramatically boosted *marginal worker productivity*
- II. Labor organizations became stronger, bolstering *sharing of productivity gains and worker voice*

Henry Ford's electrified Rouge Plant, 1919



United Auto Workers strike, 1937

Why did things go wrong in the digital age?

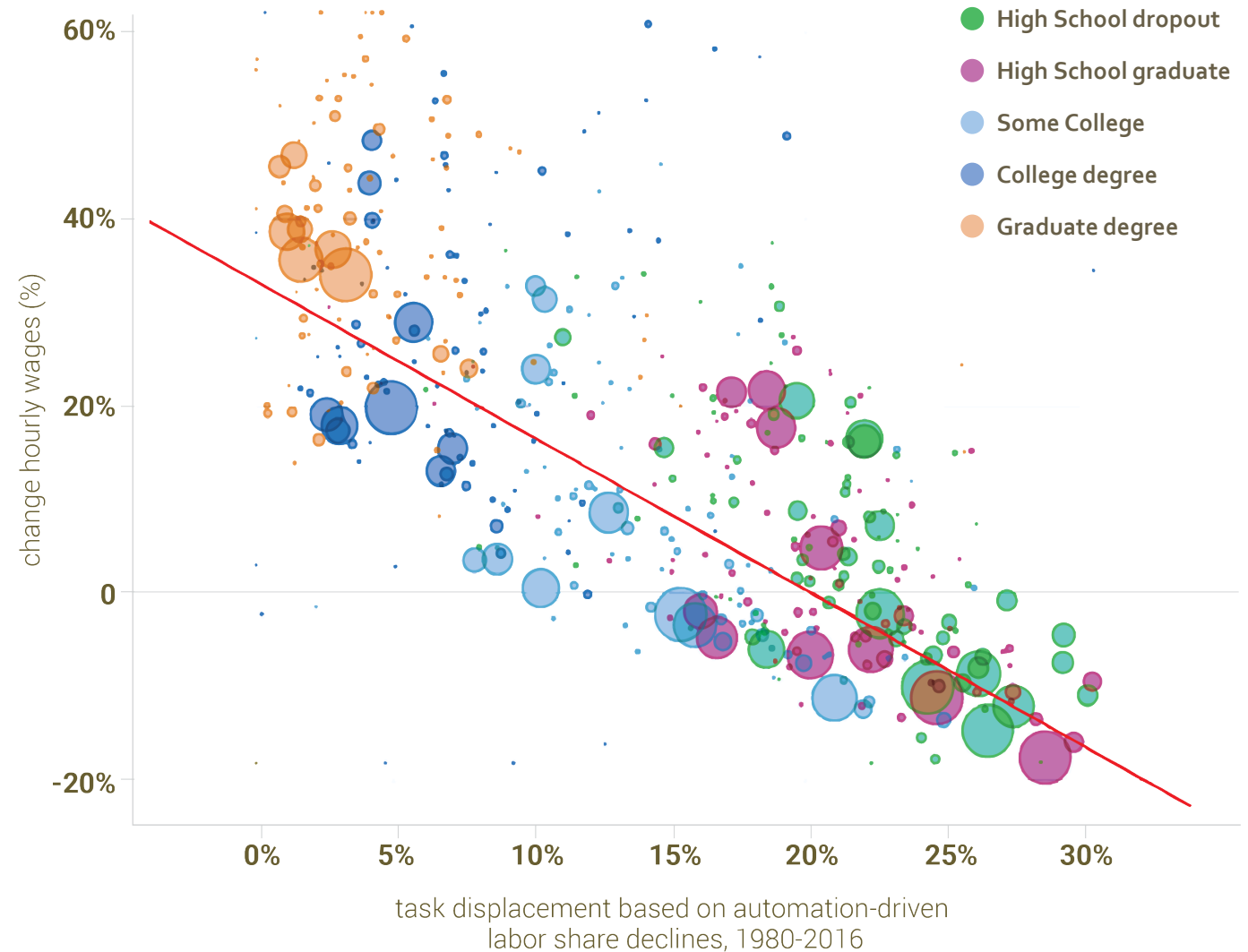
1a *Too much focus on automation, not enough on creating new tasks*



Why did things go wrong in the digital age?

1b *Consequences of automation for wages and inequality*

Change in real wages due to automation of job tasks
1980–2016



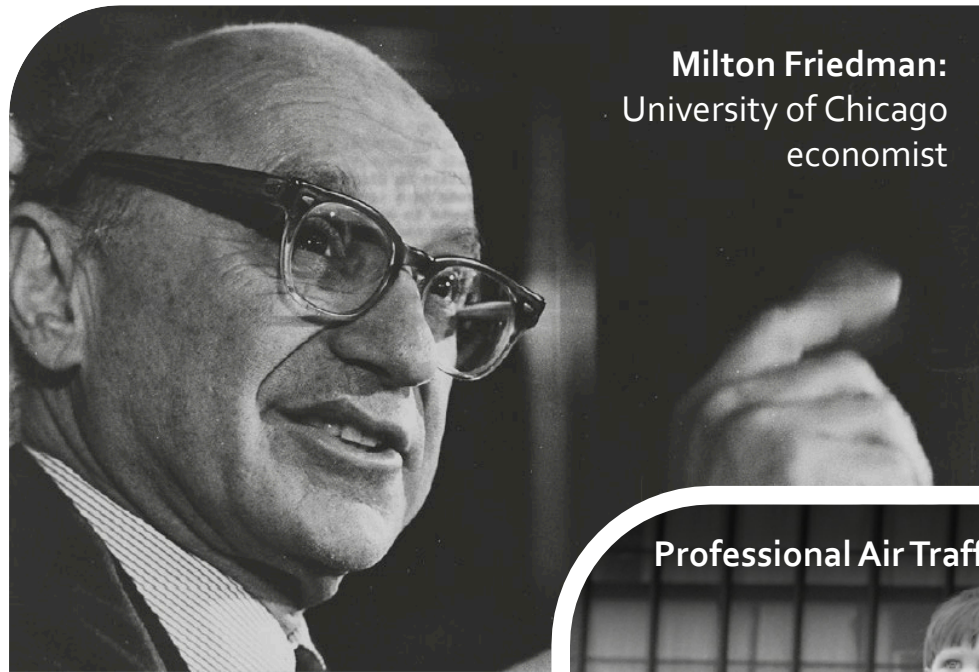
Source: Acemoglu, Daron and Pascual Restrepo. 2022. "Tasks, Automation, and the Rise in U.S. Wage Inequality." *Econometrica*, 90(5): 1973–2016.

Why did things go wrong in the digital age?

2 *New corporate visions and erosion of worker power*

“The social responsibility of business is to increase its profits”

—Milton Friedman, 1970



Milton Friedman:
University of Chicago
economist

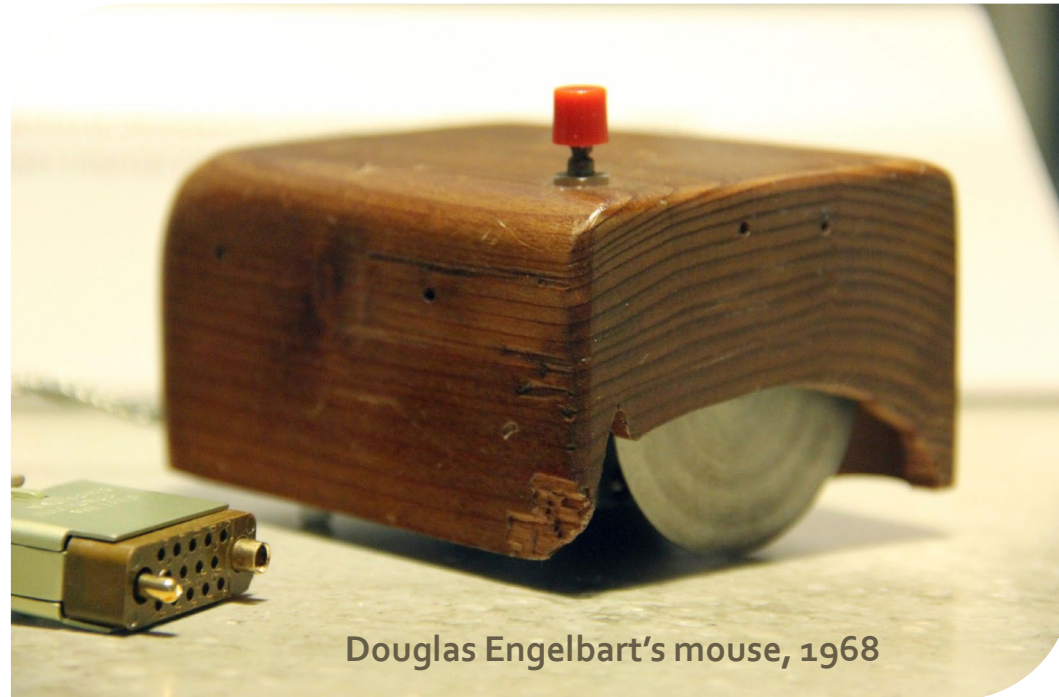
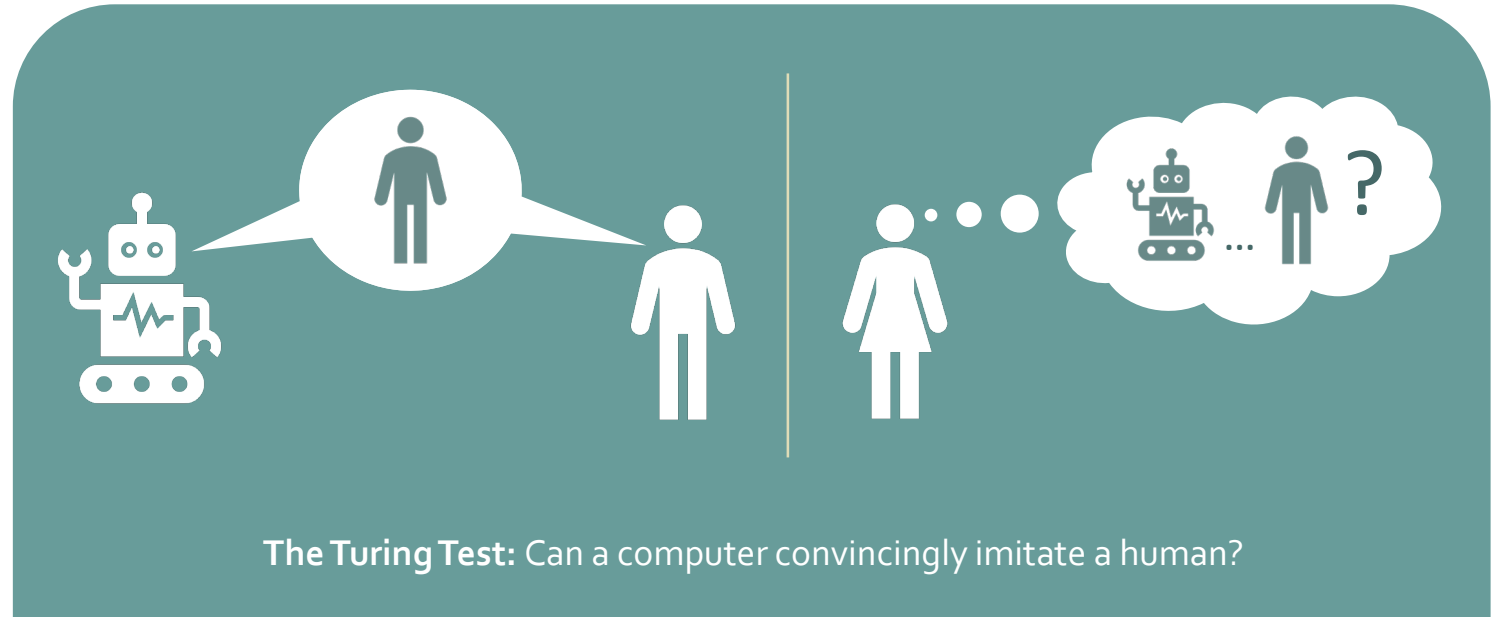


Professional Air Traffic Controllers strike, 1981

Can the age of AI be different?

The previous orthodoxy aimed for “machine intelligence”;

It is much better to focus on “machine usefulness”



Consequences of fixation on “machine intelligence”?

Self-checkout kiosks transfer work to customers, but do not improve productivity; this is “so-so automation”



Will “generative AI” reverse these long- term trends of *widened inequality, weakened worker power, and low productivity growth?*

We asked ChatGPT for its opinion.
It offered this explanation:

“Perhaps, but probably not...it’s not a magic solution...if generative AI is used to replace workers instead of support them, it could have **negative consequences** for employment and the economy.”



Perhaps, but probably not. While generative AI has shown promise in various applications, such as creating new drug designs or generating new ideas, it's not a magic solution that can solve all our problems on its own. Additionally, if generative AI is used to replace workers instead of support them, it could have negative consequences for employment and the economy. It's crucial that we use this technology ethically and responsibly, and that we continue to prioritize human decision-making and critical thinking in any application of generative AI.



Surveillance is also intensifying

Similar trends in both authoritarian and democratic countries

Centralized control of data does not augur well for the future of democracy



Facebook content moderation



Chinese social credit score kiosk

Implications for the emerging world

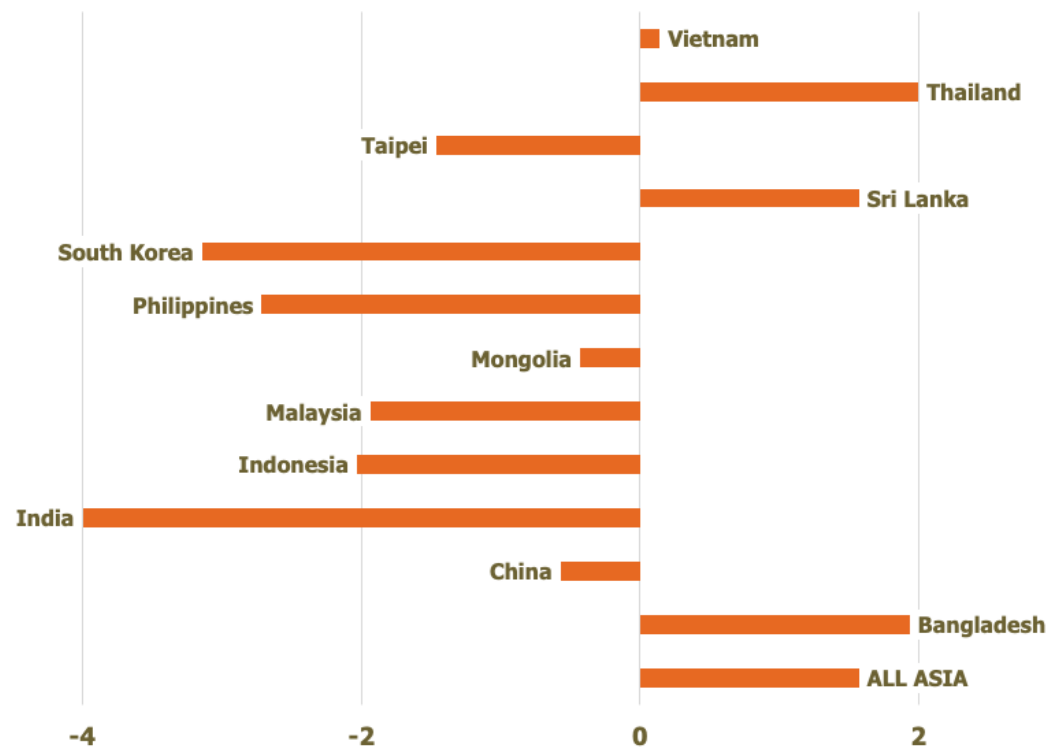
Inappropriateness of AI:

Robotics and AI are changing the global division of labor and could displace workers, 2005-2015

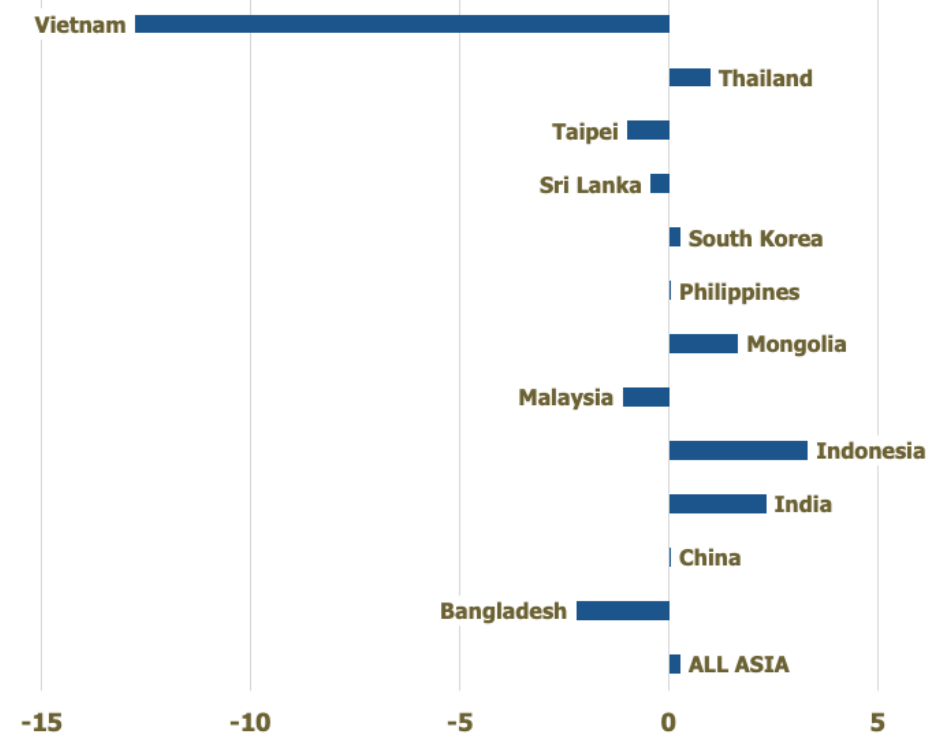
The growth in “routine” versus “nonroutine” jobs

Percentage point differences

Manufacturing



Services



What can we do?

*Change the narrative
away from the hubris
of techno-optimism*



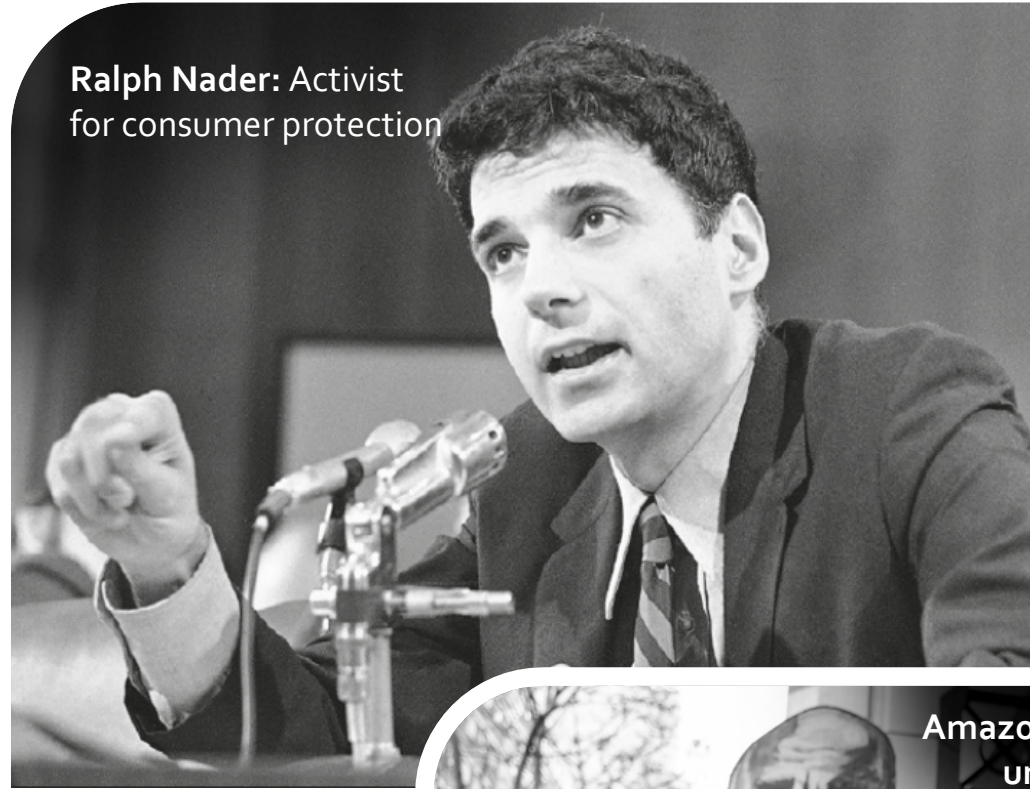
Sam Altman (OpenAI) and Elon Musk

What can we do?

Create countervailing powers

- Labor movement
- Bottom-up organizations from civil society
- Implementing appropriate regulation (e.g., taxes, antitrust, data, support worker-friendly technologies)

Ralph Nader: Activist
for consumer protection



Amazon Staten Island labor
union organizing, 2021



What can we do?

Redirect technological change to enhance human capabilities:

- New tasks for greater worker marginal productivity
- Better information for workers and human decision-makers
- Greater worker autonomy
- Empowering citizens



Ted Nelson:
technological pioneer, 1974

“

The public does not have to take what's being dished out...

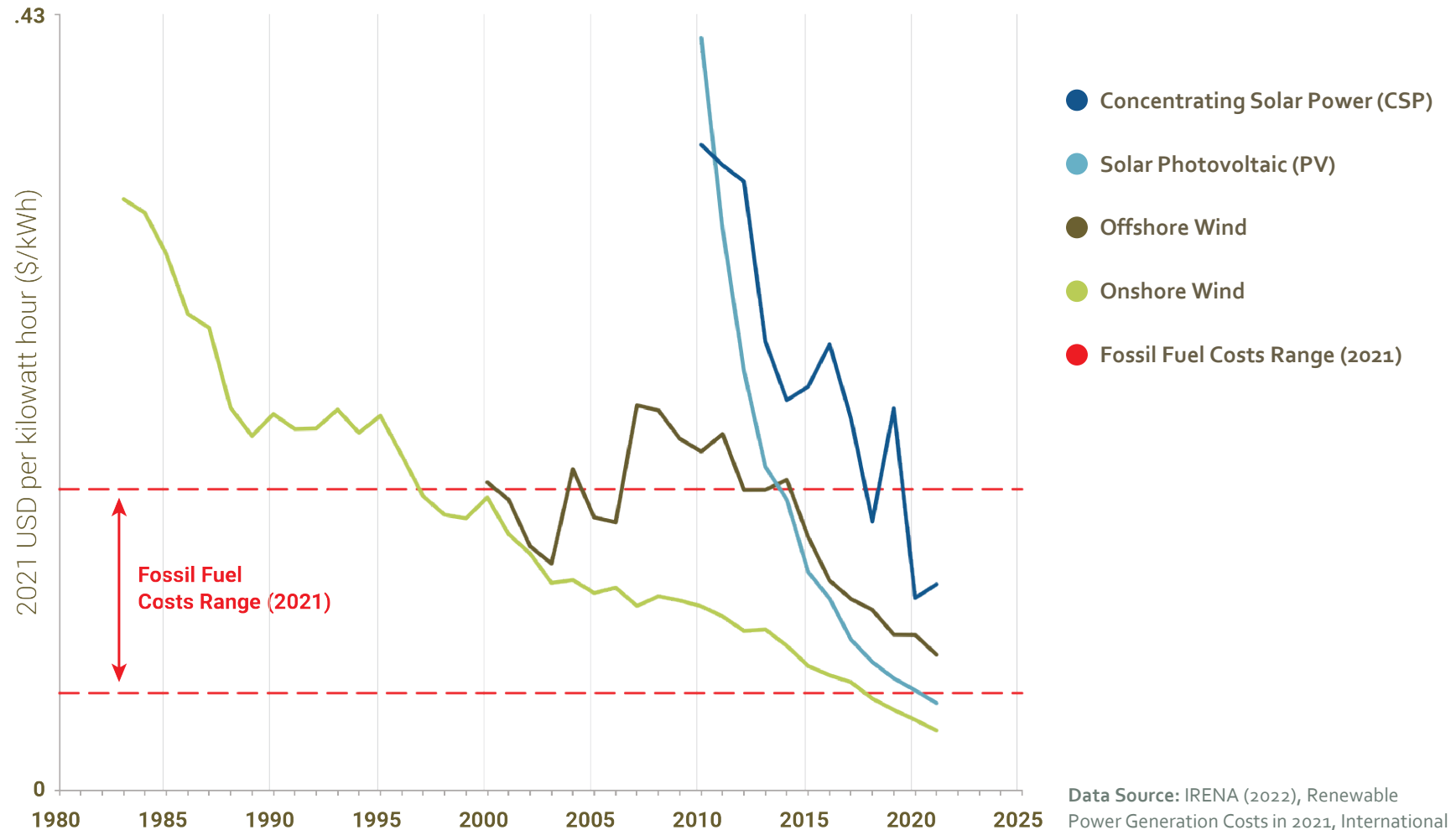
**COMPUTER POWER TO
THE PEOPLE!**

***DOWN WITH
CYBERCRUD!***”

Can we actually redirect technology?

Yes, investment in the right technologies can be achieved by societal mobilization and government policy

Cost of generating renewable electricity 1980's–2021, various utility-scale sources



Data Source: IRENA (2022), Renewable Power Generation Costs in 2021, International Renewable Energy Agency, Abu Dhabi.