

UBS Center Webinar, June 2021

Disappearing middle class

Nir Jaimovich

Professor of Economics, University of Zurich

Affiliated Professor at the UBS Center

Economics.
For Society.

Automation and employment

- "Automation" part of our everyday lexicon
- Has transformed the nature of work
- These advances have not only made us more productive...
 - Technological progress → growth
- But, induced large-scale shifts in the types of jobs performed
- Effects on the labor market are uneven: Winners and Losers

This is not just an academic discussion...



will r|

will robots take my job

will rogers

will roland

will robinson

will reeve

Automation: lessons from the past

- This is not the first time we have faced an automation change

Automation: lessons from the past



Automation: lessons from the past



Automation: fears from the past

- The Luddite experience: In 1779 English textile workers rebelled against the introduction of machinery which threatened their skilled craft
- Caprettini-Voth (2021): Relation between labor saving and social unrest

Polling – Question 1

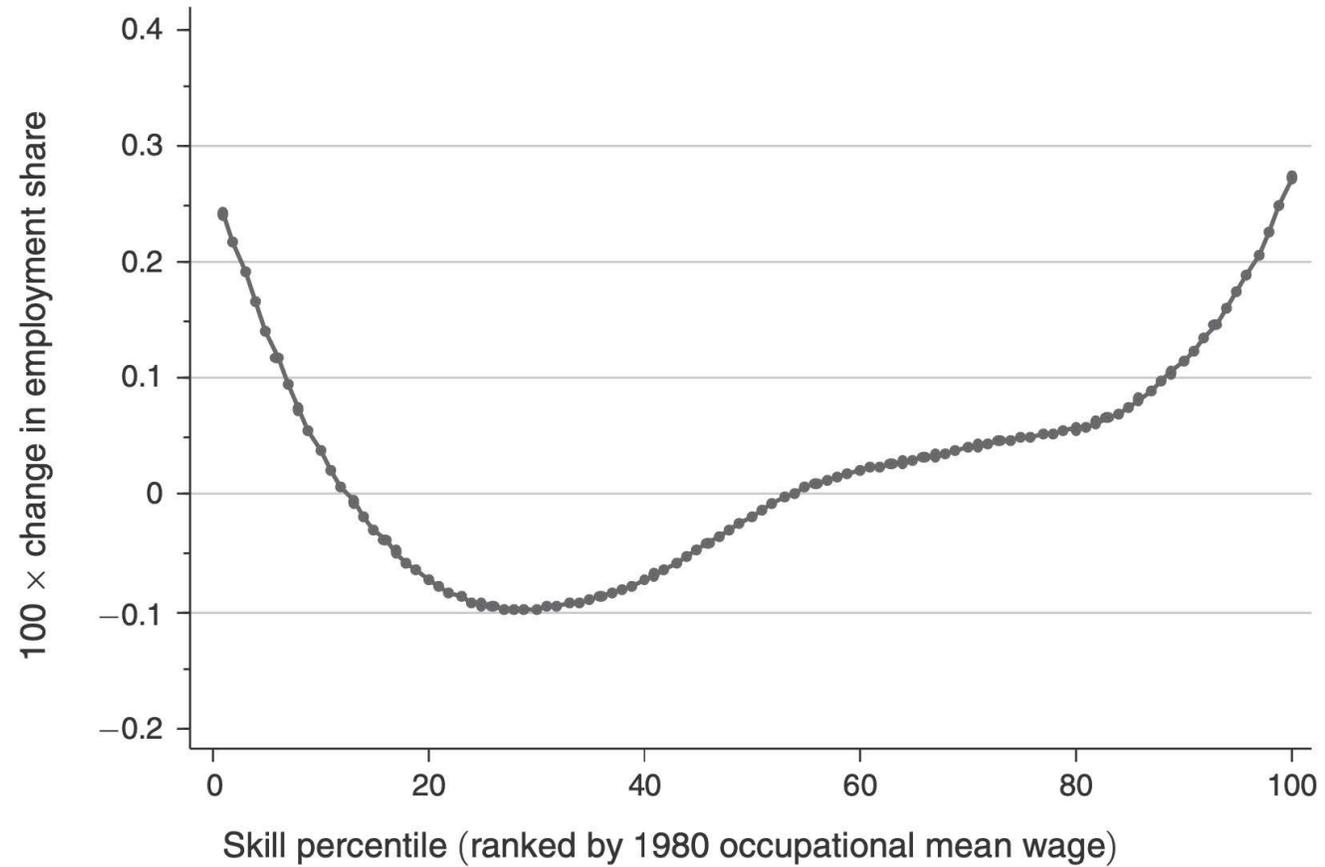
Are you worried about your job being automated or outsourced overseas?

- 1. Yes**
- 2. No**

Outline

- Let's step back... start with job opportunities affecting the middle class
 - The role of occupations
- What happens to the affected workers?
- What's to blame?
 - We started with automation...
 - But surely there are other forces
- Implications
 - Policy interventions
 - What will future labor market changes look like?

Middle class job opportunities



Source: Autor-Dorn (2013)

Middle class job opportunities



Source: Autor-Dorn (2013)

How are these related to occupations?

- Autor et al (2003): sort occupations based on task intensity
 - Cognitive vs. Manual (brain vs. brawn)
 - Routine vs. Non-Routine
- Routine: involve a limited set of tasks; tasks that are performed following instructions / rules / procedures
 - Due to their nature → susceptible to automation
- Non-routine: perform wider set of tasks; tasks that require flexibility, problem solving, discretion, human interaction

The routine matrix

	Cognitive	Manual
Routine	Secretaries and administrative support workers	Machine operators and production workers
Non-routine	Managerial, professional, and technical jobs	Janitors, gardeners, and home health aides

Routine occupations...back then



Routine occupations...now



Routine occupations...back then



Routine occupations...now



Routine occupations...back then and now

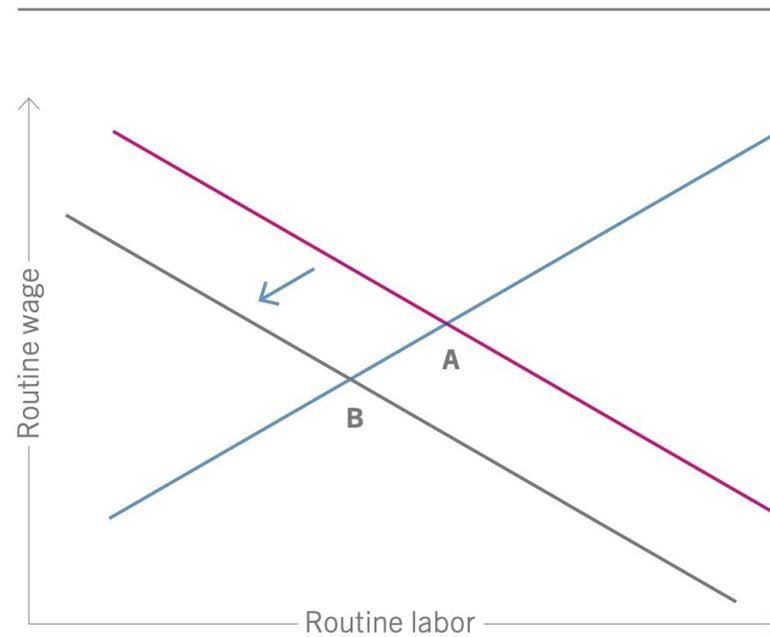
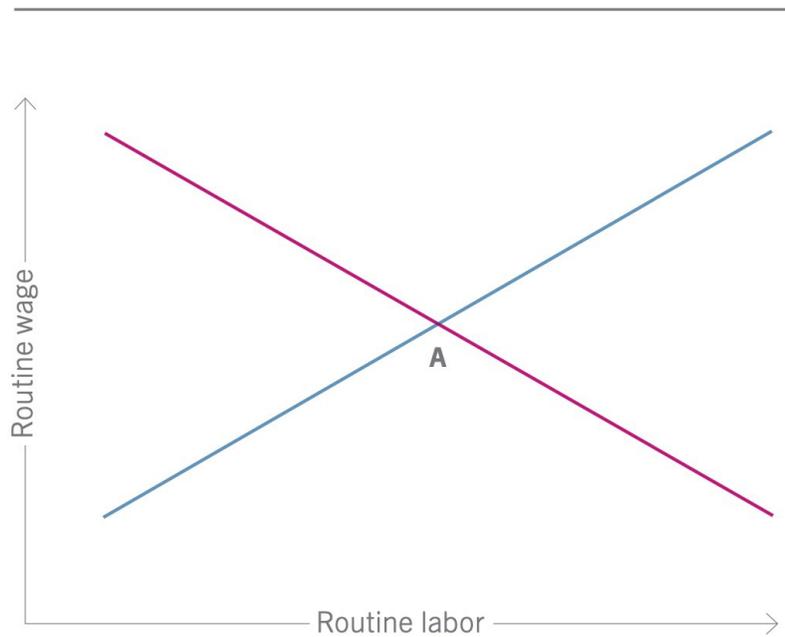


Polling – Question 2

Which category does your work fall under?

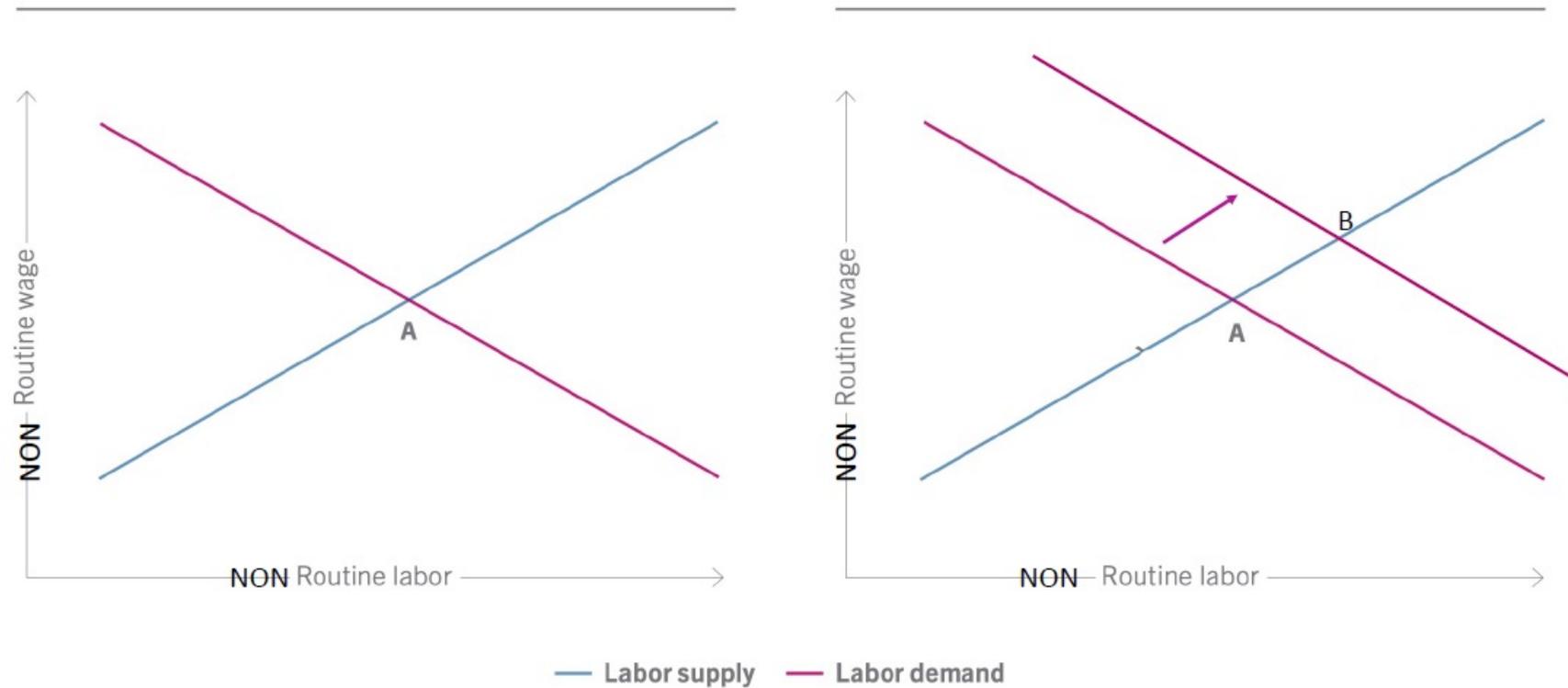
- 1. Non-routine manual**
- 2. Routine manual**
- 3. Routine cognitive**
- 4. Non-routine cognitive**

Framework: routine



— Labor supply — Labor demand

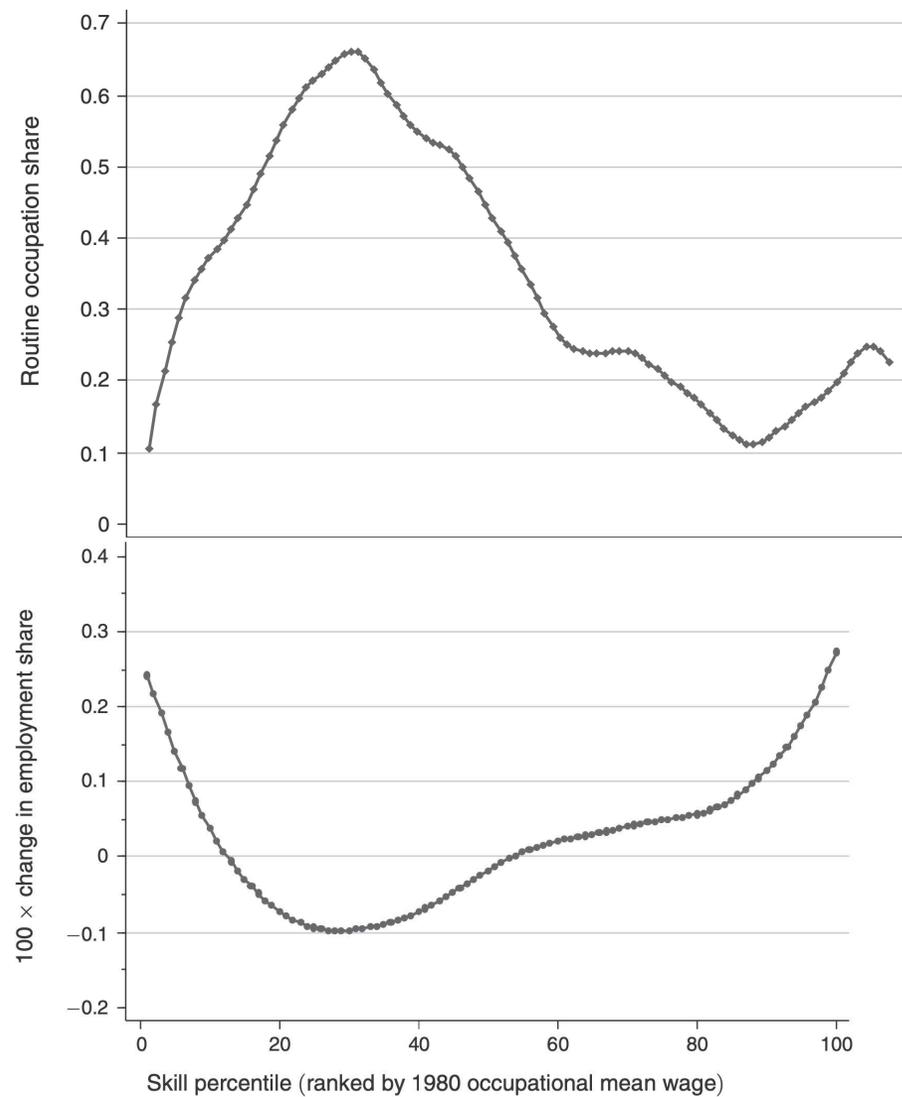
Framework: non-routine



Let's tie a beautiful bow on this...

- How is routinization related to the employment opportunities of the middle class?

Let's tie a beautiful bow on this...voila



Source: Autor-Dorn (2013)

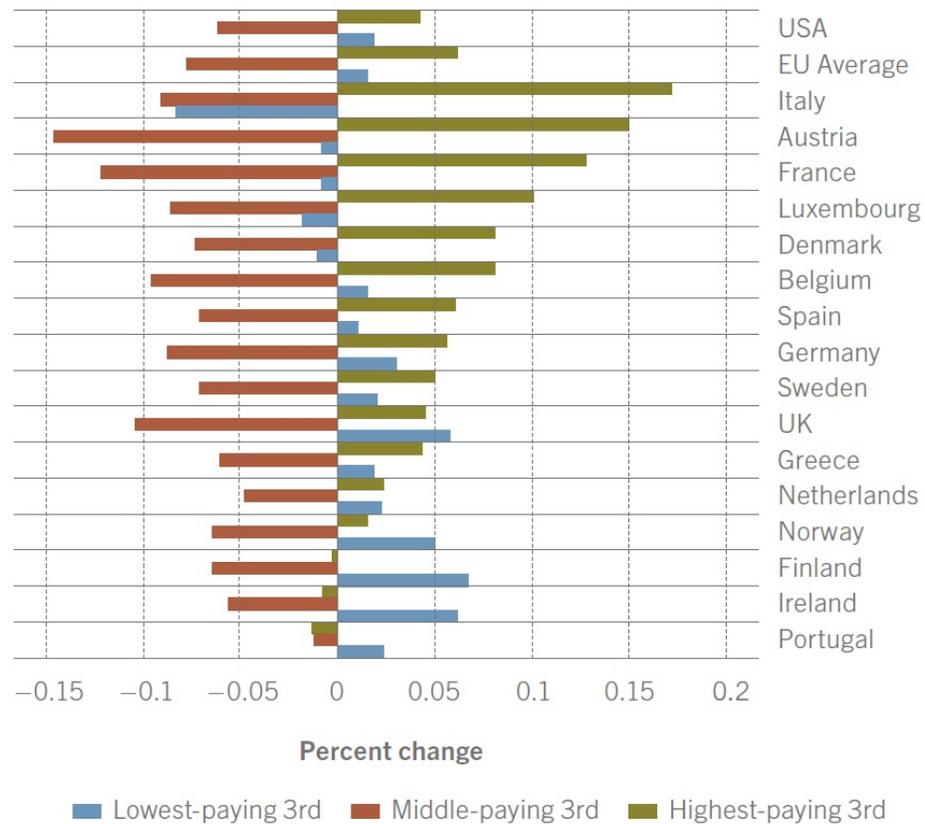
Job polarization

- Job polarization = hollowing out of the middle = disappearing middle-class
 - It is about occupations!

International job polarization

Details of process obviously not identical everywhere

Change in employment shares by occupation 1993–2006 in 16 European countries

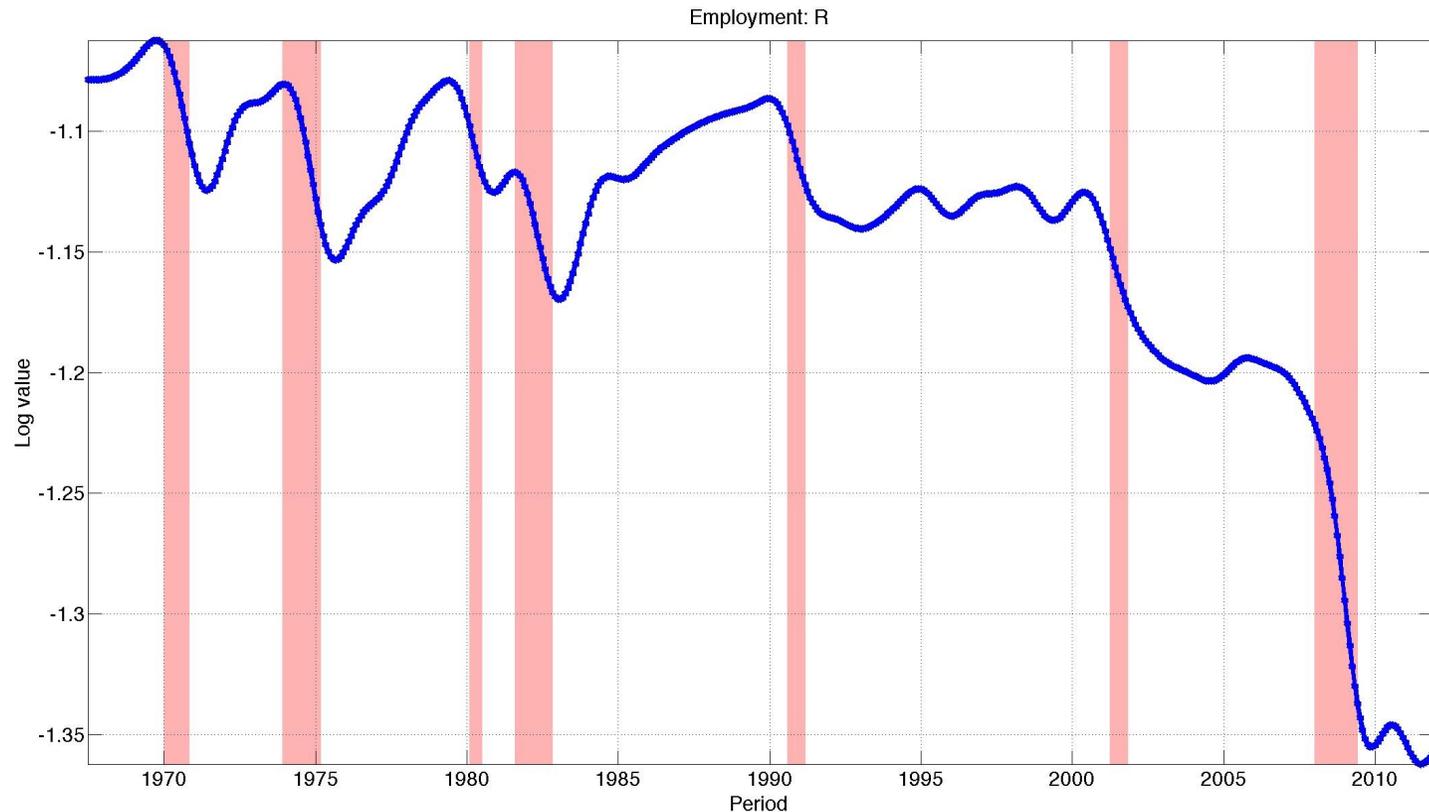


Note: Occupations grouped by wage tertile: Low, middle, high.

Timing of polarization

- Is this something that happens gradually over time?
- Or is it bunched?

Timing of polarization: routine employment



"The middle-class frog is not being gradually boiled; it is being periodically grilled at a very high heat" (NYTimes)

Source: Jaimovich-Siu (2020)

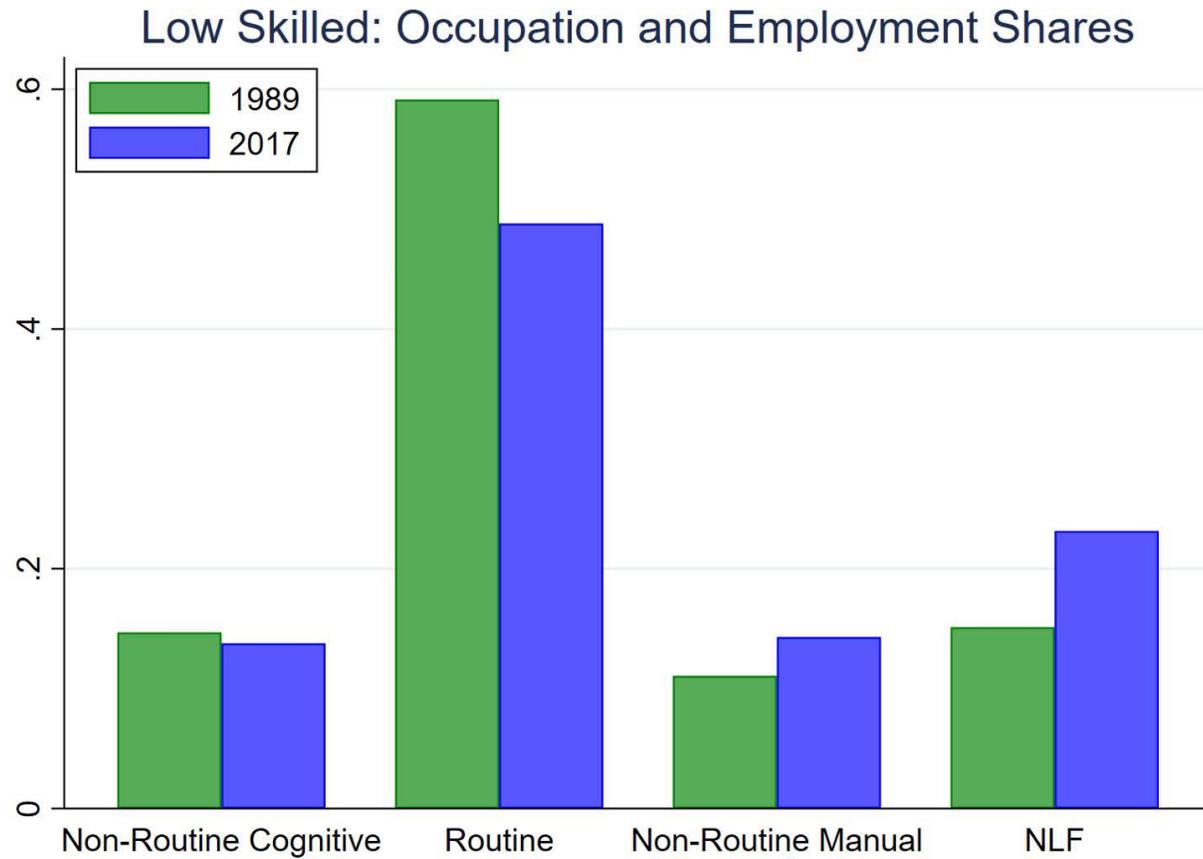
Taking stock

- Established the link between:
 - "Middle class" and "routine occupation"
 - "Middle class disappearance" and "polarization"
- Routine occupations are primed for automation
- It is an international phenomenon
- At least in the U.S. it happens in downturns

Who works (worked) in routine jobs?

- Relatively lower levels of education
 - Men (largely routine manual): high school diploma
 - Women (largely routine cognitive): high school diploma, some post-sec
 - Felt most by the young (in their 20s, early 30s)
- So what happens to people with these characteristics?

Where did they go?



Source: Jaimovich et al. (2021)

Polling – Question 3

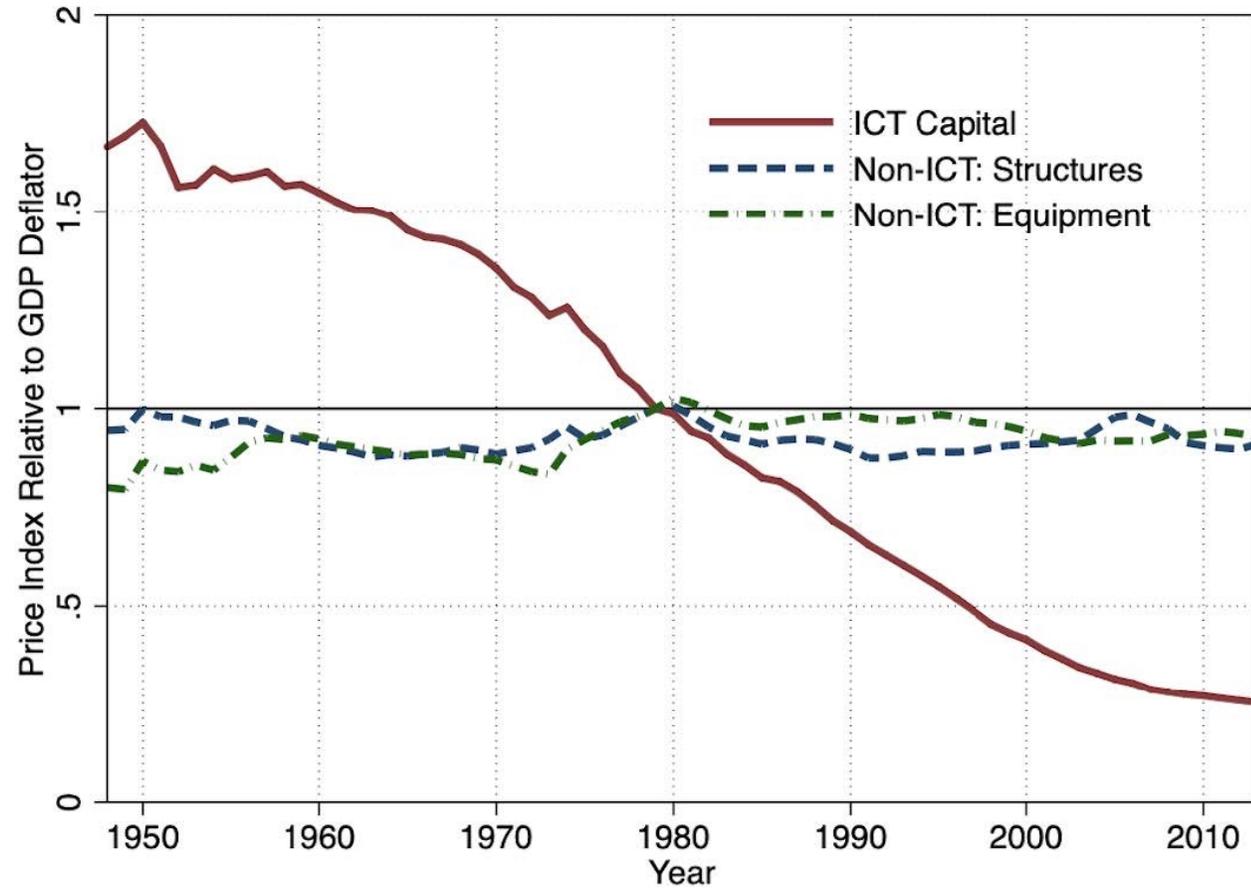
What would you do if your job were automated?

1. Retire early
2. Retrain
3. Go back to university
4. Collect welfare
5. It's too depressing to think about this question

What's behind this?

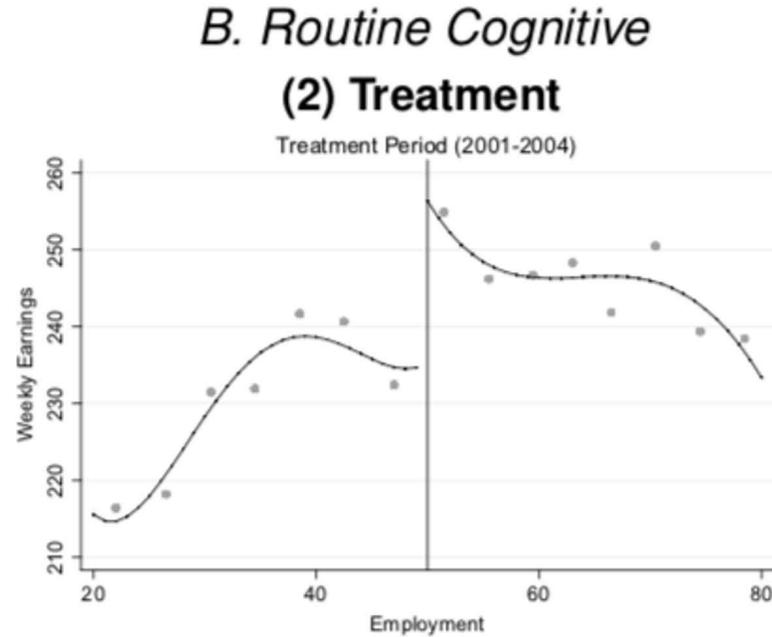
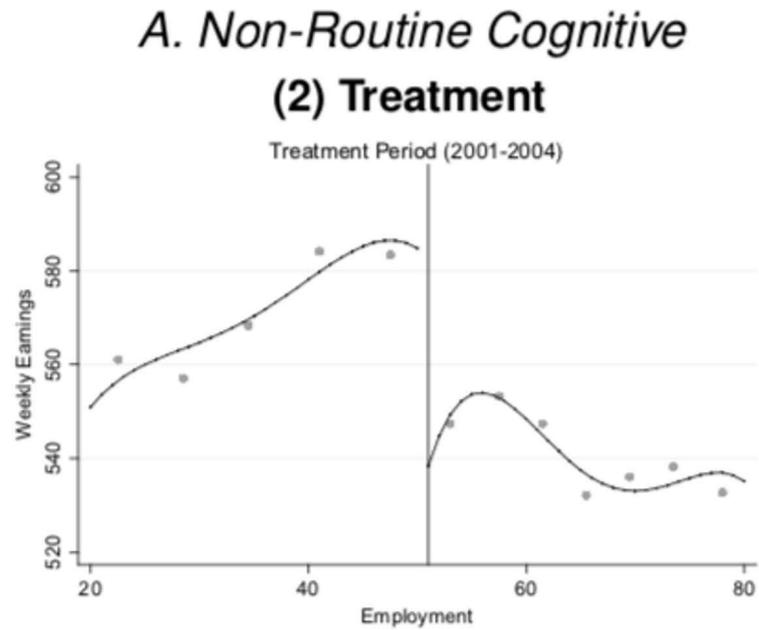
- Technological progress
 - Advances in industrial robotics, personal computing, ICT technology
- Are "jobs being lost overseas" due to globalization: international trade (of finished goods), offshoring (int'l trade of tasks)?
 - Mixed evidence (at best) of lost employment (Michaels et al (2014), Goos et al (2014), Autor et al (2015))
 - Cortes-Morris (2019): US-Mexico comparison of occupational shares Positively correlated across countries, even within auto manufacturing
- Other potential candidates without a final word...: Changes in skills, generosity of welfare

What's behind this?



Source: Eden-Gaggl (2018)

What's behind this?



Source: Gaggl-Wright (2017)

Gaggl-Wright (2017), Tuzel-Zhang (2019): natural experiment design small business tax incentive programs for ICT, equipment investment differences across eligible/ineligible firms around cutoff

So what do we do?

- The findings discussed above are informative about detecting empirical patterns
- But they do not tell us about the adjustments the economy will potentially undergo if we introduce big policy changes
- What policy interventions will help ensure gains from automation are shared by all? How do we support middle class opportunity?

So what do we do?

- The findings discussed above are informative about detecting empirical patterns
- But they do not tell us about the adjustments the economy will potentially undergo if we introduce big policy changes
- What policy interventions will help ensure gains from automation are shared by all? How do we support middle class opportunity?
- To answer such questions, we must use a more complex approach and turn to economic and quantitative modelling.
- Think about two "short-term" options
 - Retraining
 - Redistribution

Polling – Question 4

Do you think governments should pay for the retraining of workers who are affected by automation?

- 1. Yes, tax the rich to pay for it**
- 2. Yes, tax equally everyone to pay for it**
- 3. No, if people want to retrain, they should pay for it**

Retrain those outside the labor force

- Invest in costly programs which improve skills of workers displaced from routine jobs so that they re-enter labor force
- Someone has to pay.....
- Program is funded by taxes levied on the high-skilled
- Lots of equations and math, so let's skip it
- To make the program "credible": rely on the cost/return of closest existing federal program – the Trade Adjustment Assistance
 - Program assists workers in firms hurt by foreign trade and pays for retraining, among other benefits
 - See Hyman (2018)

Retrain: winners and losers

- Bring them back to (low-wage) jobs → They are direct winners
- Indirect winners: those who work in NRC occupations
- Indirect losers: those who get “crowded out” by influx of better trained workers
- Importantly – even though the program is costly and would require increased taxation...
- By reducing the number of people who are outside the labor force it significantly reduced the required tax burden

What about redistribution?

- There are many forms of redistribution...
- Today, let's think about a "hot topic": Universal Basic Income
- Some local trivia....
 - In 2016, Switzerland held a vote on a proposal to introduce a UBI
 - The supporters suggested a monthly income of 2,500 CHF for adults and 625 CHF for each child
 - The supporters had also argued that since work was increasingly automated, fewer jobs were available for workers
 - The proposal gathered more than 100,000 signatures and was put to the vote under the Swiss system
 - In the end, Swiss voters overwhelmingly rejected the proposal
 - A recurrent argument against the initiative was that it did not include the means of financing it

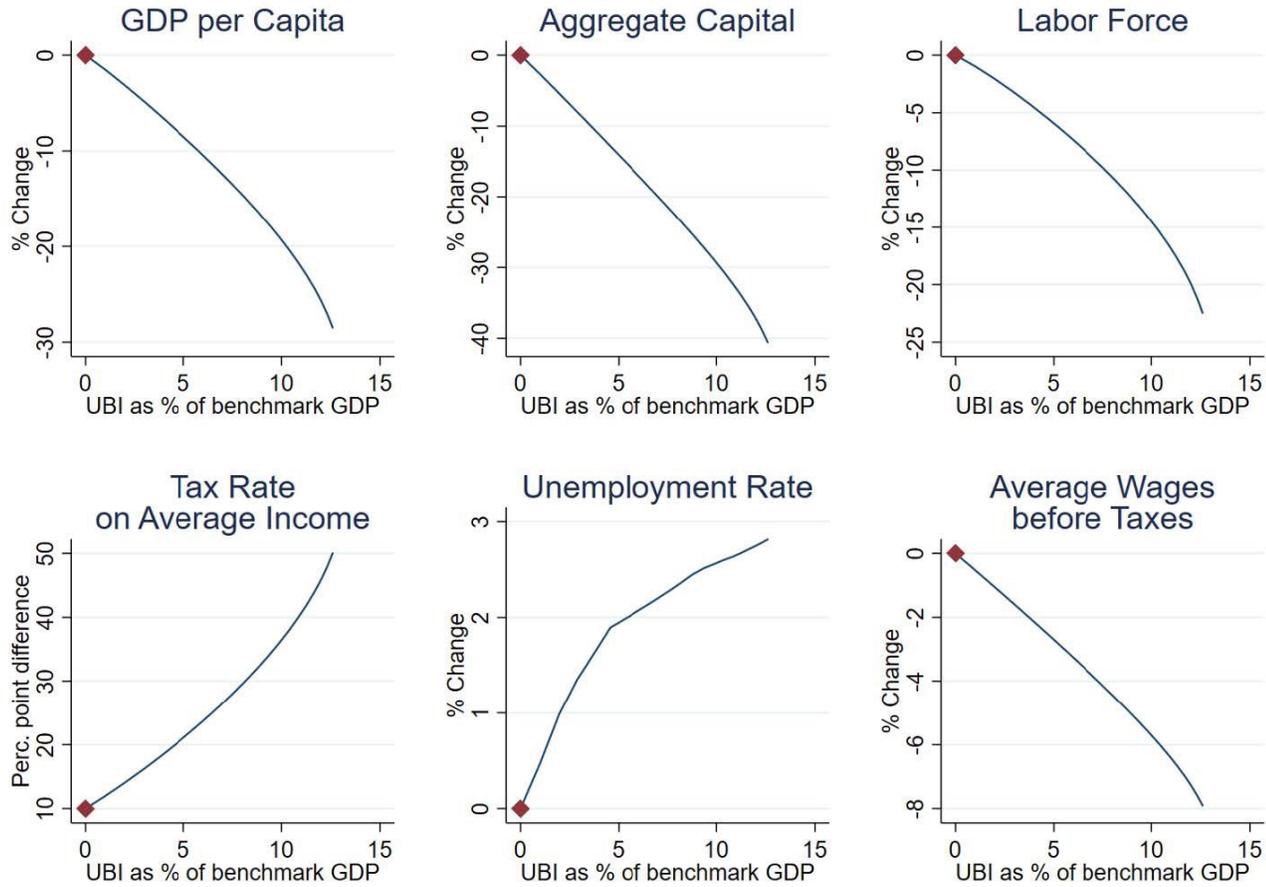
Polling – Question 5

Are you in favor of a UBI program?

1. Yes

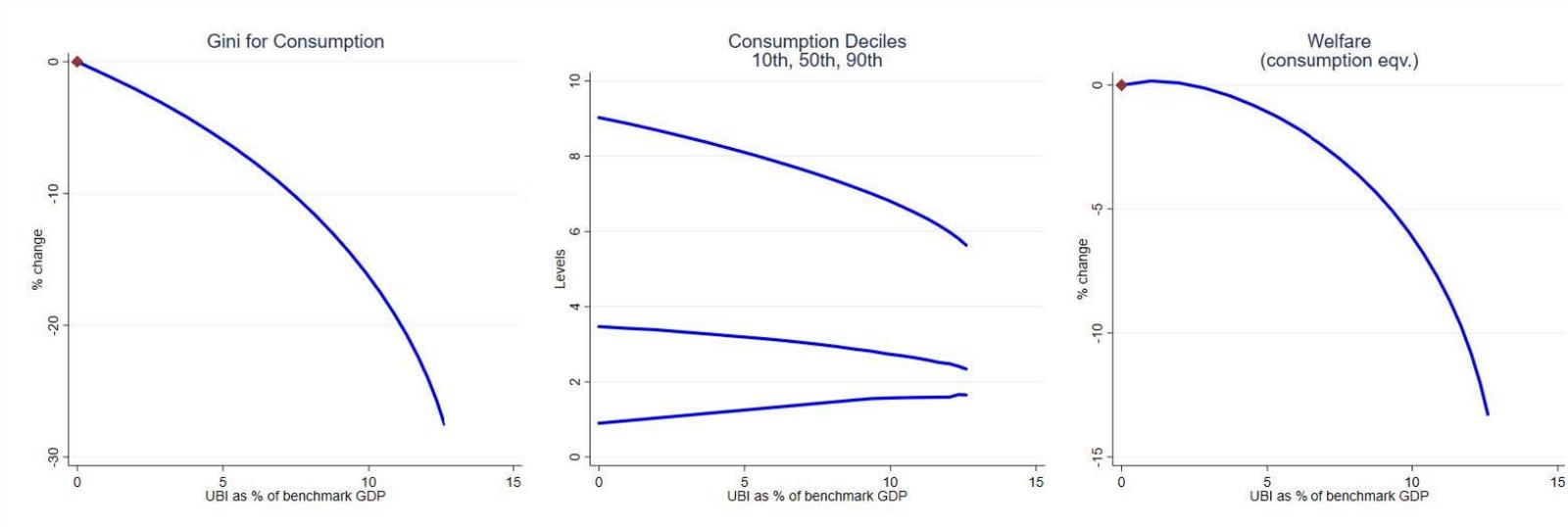
2. No

To UBI or not to UBI?



Source: Jaimovich et al. (2021)

To UBI or not to UBI?



Source: Jaimovich et al. (2021)

Implications for policy analysis: short term

- From the perspective of output and LF...
- Programs that increase the productivity and adaptability to the new required task are more promising than different redistribution plans

Implications for policy analysis: long term

- But what do we do in the long term?
- What will the future workplace look like?
- Disclaimer: *"Since the destruction of the Temple, prophecy was given over to children and the mad."*
(Bava Batra 12b)

The future workplace

TECHNOLOGY

A.I. Is Doing Legal Work. But It Won't Replace Lawyers, Yet.

By STEVE LOHR MARCH 19, 2017



Impressive advances in artificial intelligence technology tailored for legal work have led some lawyers to worry that their profession may be Silicon Valley's next victim.

But recent research and even the people working on the software meant to automate legal work say the adoption of A.I. in law firms will be a slow, task-by-task process. In other words, like it or not, a robot is not about to replace your lawyer. At least, not anytime soon.

RELATED COVERAGE



[A Lesson of Tesla Crashes? Computer Vision Can't Do It All Yet](#) SEPT. 19, 2016



[The Promise of Artificial Intelligence Unfolds in Small Steps](#) FEB. 28, 2016



[Robots Will Take Jobs, but Not as Fast as Some Fear, New Report Says](#) JAN. 12, 2017

Some optimism...

- Frey-Osborne (2017): 50% of US jobs at risk of being automated
- For example, fewer job opportunities for "general" administrative assistants...
- But technological progress creates whole new work opportunities, new occupations/tasks (Acemoglu-Restrepo, 2018)
 - Spitz-Oener (2006), Hershbein-Kahn (2018), Atalay et al (2019): Occupations evolve (becoming more complex, analytical, interactive)
 - Cortes et al (2021): increasing demand for interpersonal and social skills within occupations

The future workplace

SHARE



SHARE
005



TWEET



COMMENT



EMAIL

MATT SIMON SCIENCE 11.10.17 08:00 AM

TUG, THE BUSY LITTLE ROBOT NURSE, WILL SEE YOU NOW



ROBOTS SEEM SO far away. We're so many years from *Jetsons*-esque machines that live among us and wash our dishes and fold our clothes. But the reality is the robots have arrived—you're just not noticing them.

Take a robot called Tug, for instance. No, Tug can't talk philosophy with you, and Tug can't do your laundry. But Tug is a pioneer. Because in hospitals around the world, this robot is helping nurses and doctors care for patients by autonomously delivering food and drugs, shouldering the burden of time-consuming mundanity. And now, it's rolling

The future workplace

Occupational Outlook Handbook > Healthcare >

Medical Assistants

Summary

What They Do

Work Environment

How to Become One

Pay

Job Outlook

Summary

Quick Facts: Medical Assistants

2018 Median Pay ?	\$33,610 per year \$16.16 per hour
Typical Entry-Level Education ?	Postsecondary nondegree award
Work Experience in a Related Occupation ?	None
On-the-job Training ?	None
Number of Jobs, 2018 ?	686,600
Job Outlook, 2018-28 ?	23% (Much faster than average)
Employment Change, 2018-28 ?	154,900

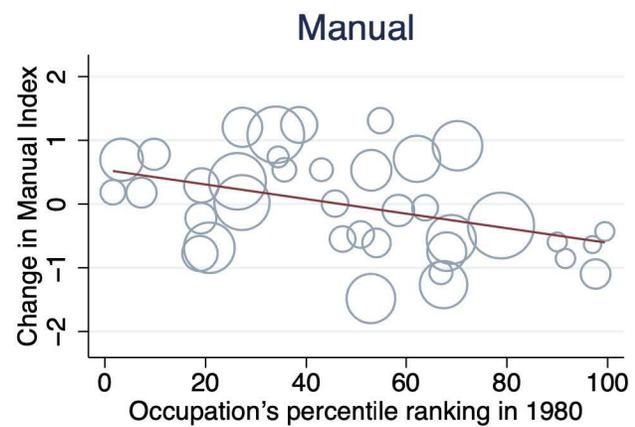
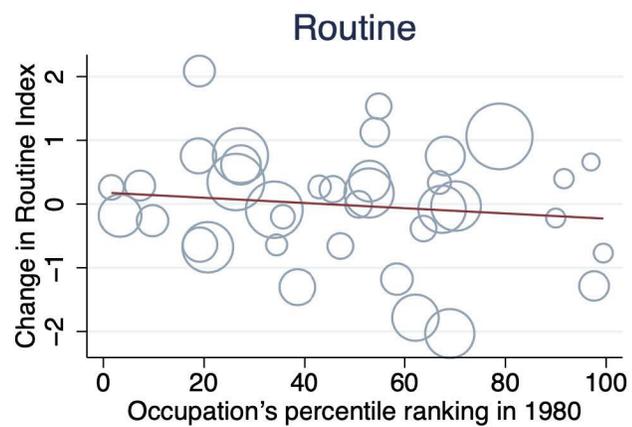
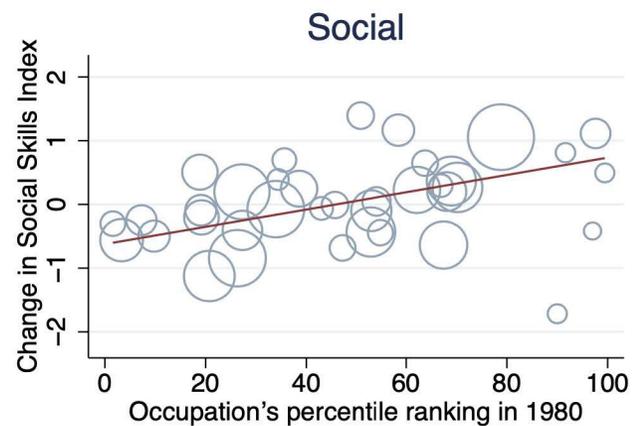
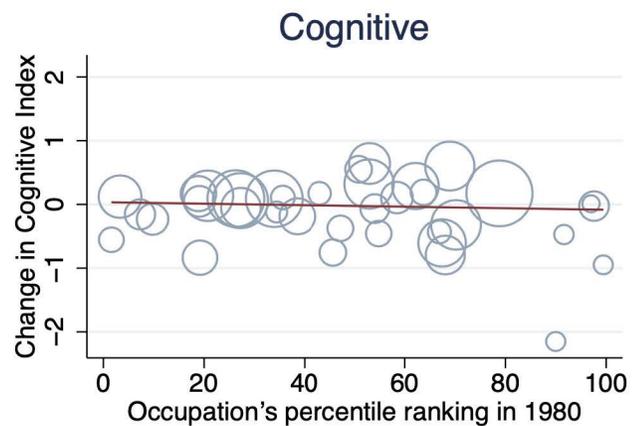
What Medical Assistants Do

Medical assistants complete administrative and clinical tasks in hospitals, offices of physicians, and other healthcare facilities.

The future workplace

- Is simply increasing (formal) education enough?
 - Beaudry-Green-Sand (2016): since 2000s, demand for high-skilled labour not keeping up with increasing supply
- Recall our framework: Technology substitutes for humans in some tasks, complements in others
- Increased returns to being a "question asker" or "problem solver"
- Logic, critical thinking, empirical reasoning
- Curiosity, creativity / ingenuity, persistence, collaboration, non-cognitive skills

The future workplace



Conclusions

- "Middle class" / "routine occupation" / polarization / automation
- Short-term cost/benefit analysis of policy options economies are facing in the face of structural changes
- Long-term adjustment to new required tasks