

*Osher Lifelong Learning Institute, Winter 2026*

## Contemporary Economic Policy Issues

Berkshire Community College

Host: Geoffrey Woglom, Director  
National Economic Education Delegation

## Course Schedule

### Contemporary Economic Policy Issues

- Week 1 (1/23): Economic Update & Central Bank Independence Geoffrey Woglom, Amherst College
- Week 2 (1/30): Federal Debt and Deficits, Kathryn Wilson Kent State University
- Week 3 (2/6): Climate Change Economics Sarah Jacobson, Williams College
- Week 4 (2/13): An Introduction to Cryptocurrencies, Geoffrey Woglom, Amherst College
- Week 5 (2/20): Saving Social Security, Jon Haveman, Executive Director NEED
- **Week 6 (2/27): AI and Inequality, Geoffrey Woglom, Amherst College**



## Artificial Intelligence and Inequality

February 27, 2026

Geoffrey Woglom,  
Emeritus Professor, Amherst College



NATIONAL ECONOMIC  
EDUCATION DELEGATION

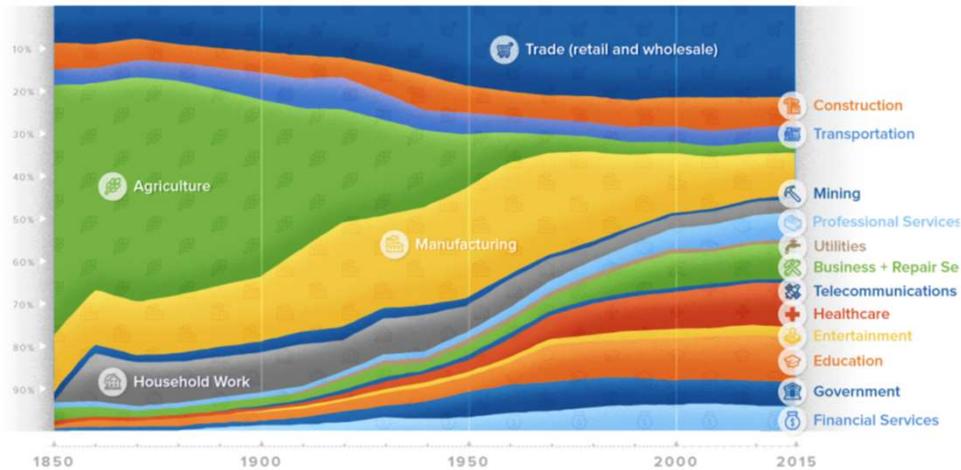
## Outline

1. Lessons from 2 episodes Technological Changes during the 20<sup>th</sup> Century.
  2. What is the current state of AI?
  3. How will the adoption of this technology affect inequality.  
Spoiler Alert: No One Really Knows?
  4. Recent Evidence on the Effects of AI.
  5. Implications for our grandchildren's future.
- I will not discuss the possibility of an "AI Takeover" of humanity



NATIONAL ECONOMIC  
EDUCATION DELEGATION

## Two Major Shifts in Employment



NATIONAL ECONOMIC  
EDUCATION DELEGATION

<https://www.visualcapitalist.com/visualizing-150-years-of-u-s-employment-history/>

5

## Out of Agriculture

- D. Autor, C. Goldin, and L. Katz, "Extending the Race between Education and Technology" *AEA Papers and Proceedings 2020*, 110: 347–351
- Technology increases the demand for skilled workers tending to raise their wages.
- Education increases the supply of skilled workers tending to lower their wages.

**Example: Shift from agriculture to manufacturing in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries: Increasing demand for high school graduates**

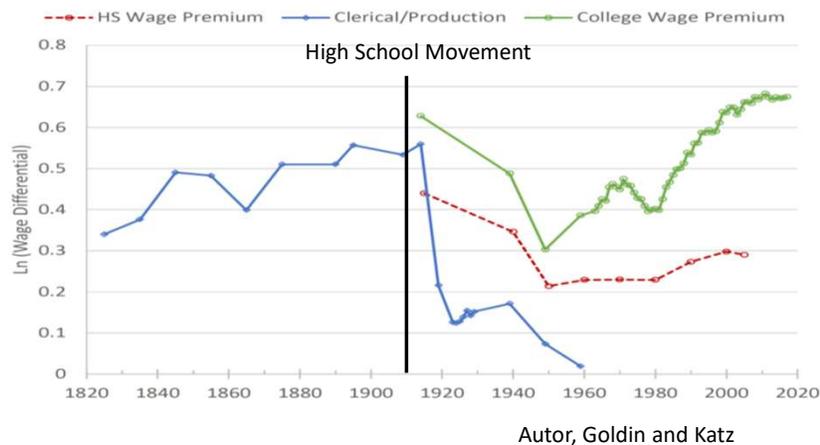


NATIONAL ECONOMIC  
EDUCATION DELEGATION

6

## Historical Returns to Education

Figure 1: Educational and Occupational Wage Differentials: 1825 to 2017



NATIONAL ECONOMIC  
EDUCATION DELEGATION

7

## Early 20<sup>th</sup> Century Technology Adjustment

### Four Keys to Success:

1. New technology created jobs in new sectors where labor was more productive. (e.g., Model T).
2. Wealthier nation could afford the new schooling and afford to buy the new goods.
3. Farm workers were geographically mobile to move to the new jobs.
4. Increase in educational attainment increased the supply of workers for new jobs.



NATIONAL ECONOMIC  
EDUCATION DELEGATION

8

## Lessons of the Effects of Technology

1. Some of the new technologies substituted for existing labor **automating** jobs (cotton picking machines, 1943).
2. Some of the new technologies **augmented** labor increasing jobs (Black & Decker mass produced pistol grip electric drills in 1917).
3. Some new technologies created new goods and more new jobs (electrical engineers with the development of the electric grid).
4. New technologies increased wealth and increased the demand for all types of labor; GDP per capita increased by 80% between 1900 and 1929).

## Early 20<sup>th</sup> Century Technologies Were GPT

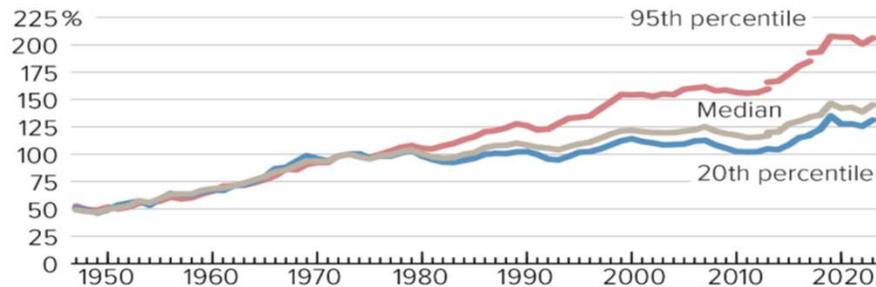
- **General Purpose Technologies (GPT) are foundational innovations that affect many sectors of the economy.**
  1. Electricity.
  2. Automobiles.
  3. Transistors.
- **These GPTs did substitute for some labor, but augmented most labor and created many new occupations and industries.**

## The Abrupt Increase in Inequality

FIGURE 1

### Income Gains Widely Shared in Early Postwar Decades — But Not Since Then

Real family income between 1947 and 2023, as a percentage of 1973 level



Note: Breaks indicate implementation of a redesigned questionnaire (2013) and an updated data processing system (2017).

Source: CBPP calculations based on U.S. Census Bureau Data



NATIO  
EDUCATION DELEGATION

CENTER ON BUDGET AND POLICY PRIORITIES | CBPP.ORG

Source: Arloc Sherman, Danilo Trisi, and Joseph Cureton, "A Guide to Statistics on Historical Trends in Income Inequality," Center on Budget and Policy Priorities, Policy Futures, Dec. 11, 2024.

11

## Recent Experience of Technology & Wage Inequality

### Acemoglu (Nobel 2024) & Restrepo:

- "We document that between 50% and 70% of changes in the U.S. wage structure over the last four decades are accounted for by relative wage declines of worker groups specialized in **routine tasks** in industries experiencing rapid automation."
- What Characterized industries experiencing rapid automation?



NATIONAL ECONOMIC  
EDUCATION DELEGATION

*Econometrica*, Vol. 90, No. 5 (September, 2022), 1973–2016

12

## David Autor and Labor Market Polarization

FIGURE 3

Percentage point change in employment by occupation, 1979–2009



NATIONAL ECONOMIC  
EDUCATION DELEGATION

13

[https://www.hamiltonproject.org/wp-content/uploads/2023/01/The\\_Polarization\\_of\\_Job\\_Opportunities\\_in\\_the\\_US\\_Labor\\_Market-\\_Implications\\_for\\_Employment\\_and\\_Earnings.pdf](https://www.hamiltonproject.org/wp-content/uploads/2023/01/The_Polarization_of_Job_Opportunities_in_the_US_Labor_Market-_Implications_for_Employment_and_Earnings.pdf)

## Causes of Polarization in the Early 21st Century

- Automation substituted machines for labor for *routine* work; e.g., bookkeeping, clerical work and repetitive production work – middle skill jobs. Thereby lowering the demand for these workers.
- As a result, the relative demand for two kinds of *nonroutine* work rose;
  1. Abstract tasks such as problem solving, intuition and persuasion; many of these jobs, but not all require formal training and/or a college degree.
  2. Manual tasks requiring little formal education such as janitors, home health aide workers, construction laborers.



NATIONAL ECONOMIC  
EDUCATION DELEGATION

14

## Polarization and Wage Inequality

- High-skilled jobs requiring a **college education** increased as well as wages.
- Conversely, middle-skilled jobs fell along with wages.
- Low-skilled jobs demand rose, but the supply of workers also rose as displaced middle skilled workers found low skill jobs.
- Race between the demand and supply of high-skilled workers was won by demand during this period.
- How will this story change with the introduction of AI?



## What is Artificial Intelligence?

- **Definition:** The capacity of machines to simulate intelligent behavior. Such as learning, problem solving, reasoning, perception and decision making.
- **Machine Learning (ML):** Train computer to do a specific task by *reinforcement*.
- **Alpha-Go and Alpha-Go Zero:** 2016 beats World Champ.  
<https://deepmind.google/research/projects/alphago/>
- **Reading Mammograms** “...urgent efforts should be made to integrate AI-supported mammography into screening guidelines and to promote the widespread adoption of AI in mammography screening programs.  
(<https://www.nature.com/articles/s41591-024-03408-6>)



## Generative AI: ChatGPT et. al.

- **Generative AI and Large Language Models (LLM):** Train computers on massive amounts of data to predict patterns, and use these predictions to generate “new” content.
- It is still a kind of reinforcement, but the “game” is to predict what word, image, music comes next.
- You play the “game” by providing a prompt in natural language; e.g.
  - “What is a neural network?”
  - “Perplexity:” A neural network is a computational system inspired by the structure and function of biological brains, designed to recognize patterns and learn from data by adjusting connections between artificial “neurons” arranged in layers.



## “New” Content





**DIEP NEP.**

**THIS IS NOT MORGAN FREEMAN.**

 NATIONAL ECONOMIC EDUCATION DELEGATION

19

**Funny, but Scary Too**



 NATIONAL ECONOMIC EDUCATION DELEGATION

20

# Augmentation or Automation?

AI Actress Tilly Norwood



# US Investment in AI is Exploding

Global private investment in AI by geographic area, 2013–24  
Source: Quid, 2024 | Chart: 2025 AI Index report

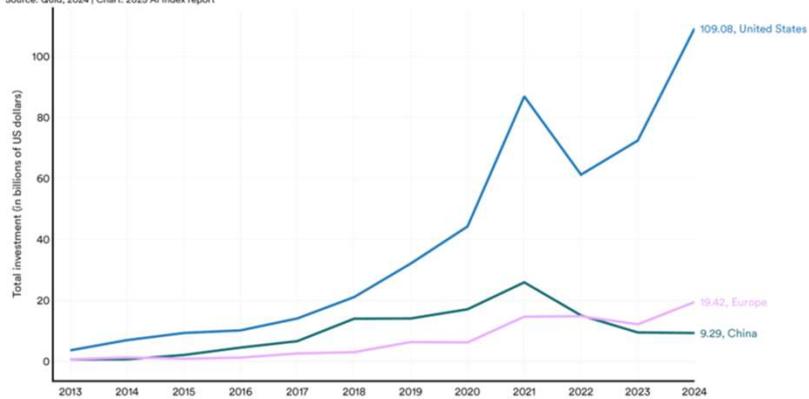
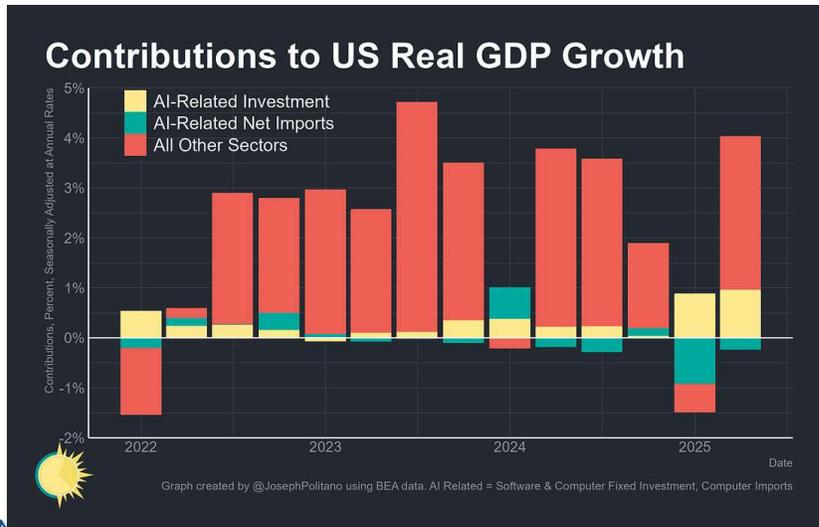
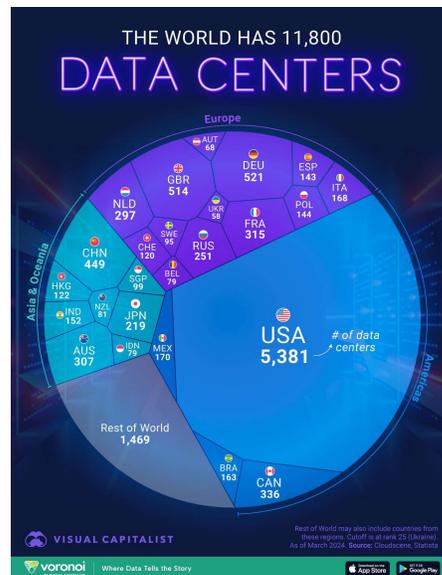


Figure 4.3.10

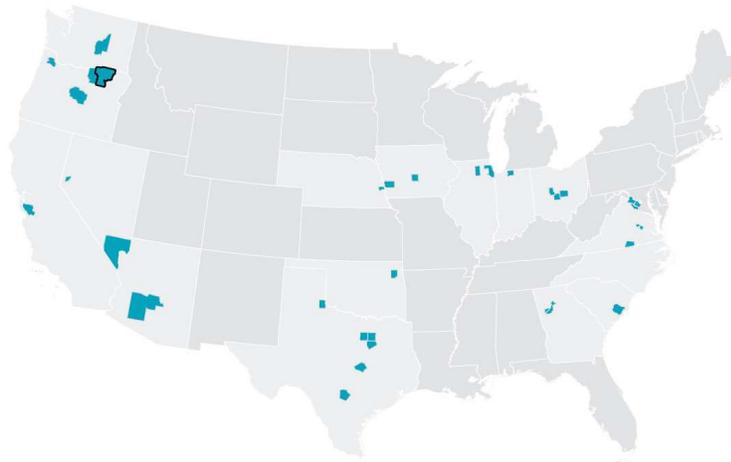
# AI Investment is Driving GDP Growth



# Data Centers

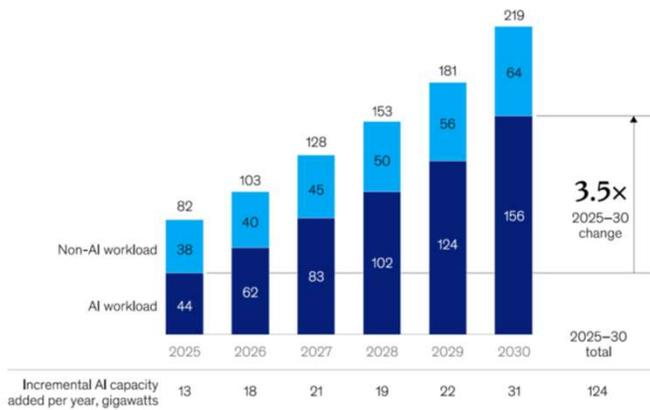


# 33 Counties Account for 72% of Data Centers



# And, It Has Only Just Begun

Estimated global data center capacity demand, 'continued momentum' scenario, gigawatts



One Nuclear power plant adds about 1 Gigawatt in electric capacity

<https://www.eia.gov/energyexplained/nuclear/us-nuclear-industry.php>

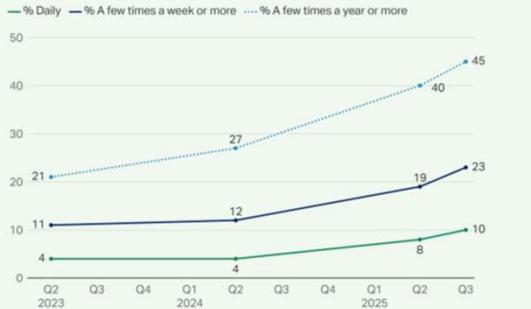
Note: Figures may not sum to totals, because of rounding. Source: McKinsey Data Center Demand Model; Gartner reports; Nvidia capital markets reports



# AI Usage is Growing

## AI Use Continues to Grow Among U.S. Workers

How often do you use artificial intelligence in your role — daily, a few times a week, a few times a month, a few times a year, once a year, less than once per year, or never?



WF Q3 2025, U.S. employees  
Get the data • Download image

## Employees Most Often Use AI to Consolidate Information and Generate Ideas

In what ways are you currently using artificial intelligence (AI) to assist with your work? % Selected



WF Q3 2025, AI users  
Get the data • Download image

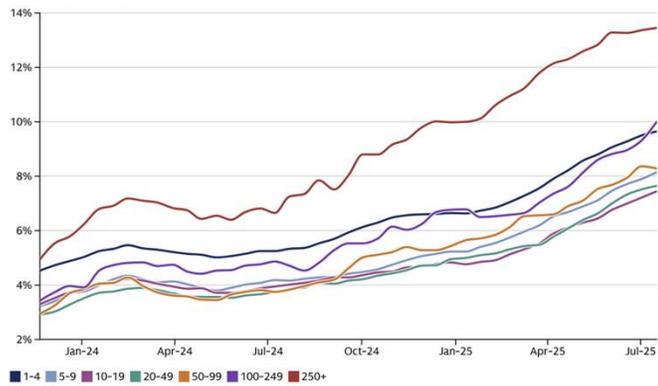
# ChatGPT and Tasks



# AI is Making it into the Workplace (slowly)

AI adoption has accelerated among larger companies, but adoption remains low

AI adoption rate\*, by firm size



Source: Census Bureau, Goldman Sachs Research  
\*Six survey moving average. Surveys are generally biweekly.

Goldman Sachs



<https://www.goldmansachs.com/insights/articles/how-will-ai-affect-the-global-workforce>

# Cautionary Tale: "The Internet Changes Everything"

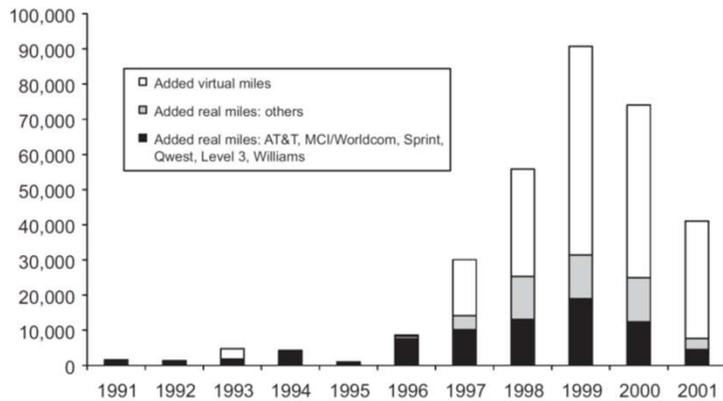


Fig. 1. Yearly additions to total route miles, 1990-2001.



Source: U.S. Bureau of Labor Statistics via FRED®  
Shaded areas indicate U.S. recessions.

fred.stlouisfed.org



## What is the Big Deal?

- Robert Solow Paradox, 1987: “You can see the computer age everywhere but in the productivity statistics.”
- *The Economist* May 2025 Echo: “Why AI hasn’t taken my job?”
- But the resolution of the Solow Paradox occurred in the late 1990s with a surge of productivity growth!

## Paradox Resolved

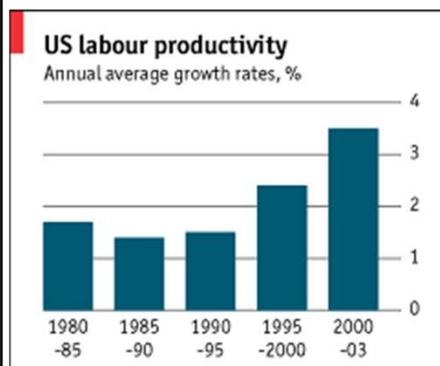
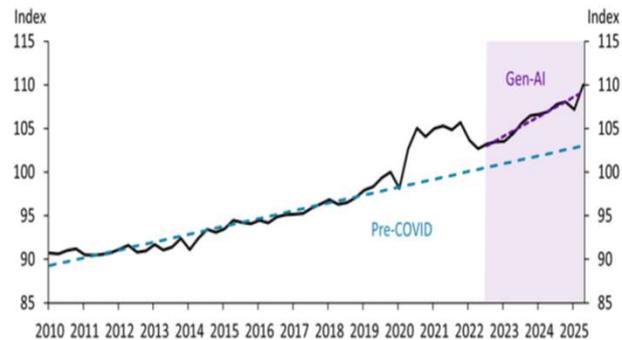


Chart 1: Labor productivity has moved farther above its pre-pandemic trend since late 2022



Notes: The solid line shows output per hour in the private nonfarm business sector, indexed to 2019:Q4 = 100. Trends are fitted over 2010:Q1–2019:Q4 (pre-pandemic) and 2022:Q3–2025:Q2 (gen-AI).  
Sources: Federal Reserve Bank of Chicago and authors' calculations.

# How Will AI Automation Be Different?

## Polyani 's Paradox: "We can know more than we can tell"

- **Tacit knowledge:** Tasks humans accomplish effortlessly yet cannot be explained by a set of rules: How do we recognize a piece of furniture as a chair?
- **In contrast to codified knowledge or "book learning:"** Instruction Manual.

Do ML models have tacit knowledge.

# The Coming Disruption: The View from Microsoft

## AI is Most Applicable

## AI is Least Applicable

Job Title (Abbrev.)	Coverage	Cmpltn.	Scope	Score	Employment	Job Title (Abbrev.)	Coverage	Cmpltn.	Scope	Score	Empl.
Interpreters and Translators	0.98	0.88	0.57	0.49	51,560	Phlebotomists	0.06	0.95	0.29	0.03	137,080
Historians	0.91	0.85	0.56	0.48	3,040	Nursing Assistants	0.07	0.85	0.34	0.03	1,351,760
Passenger Attendants	0.80	0.88	0.62	0.47	20,190	Hazardous Materials Removal Workers	0.04	0.95	0.35	0.03	49,960
Sales Representatives of Services	0.84	0.90	0.57	0.46	1,142,020	Helpers-Painters, Plasterers, ...	0.04	0.96	0.38	0.03	7,700
Writers and Authors	0.85	0.84	0.60	0.45	49,450	Embalmers	0.07	0.55	0.22	0.03	3,380
Customer Service Representatives	0.72	0.90	0.59	0.44	2,858,710	Plant and System Operators, All Other	0.05	0.93	0.38	0.03	15,370
CNC Tool Programmers	0.90	0.87	0.53	0.44	28,030	Oral and Maxillofacial Surgeons	0.05	0.89	0.34	0.03	4,160
Telephone Operators	0.80	0.86	0.57	0.42	4,600	Automotive Glass Installers and Repairers	0.04	0.93	0.34	0.03	16,890
Ticket Agents and Travel Clerks	0.71	0.90	0.56	0.41	119,270	Ship Engineers	0.05	0.92	0.39	0.03	8,860
Broadcast Announcers and Radio DJs	0.74	0.84	0.60	0.41	25,070	Tire Repairers and Changers	0.04	0.95	0.35	0.02	101,520
Brokerage Clerks	0.74	0.89	0.57	0.41	48,060	Prosthodontists	0.10	0.90	0.29	0.02	570
Farm and Home Management Educators	0.77	0.91	0.55	0.41	8,110	Helpers-Production Workers	0.04	0.93	0.36	0.02	181,810
Telemarketers	0.66	0.89	0.60	0.40	81,580	Highway Maintenance Workers	0.03	0.96	0.32	0.02	150,860
Concierges	0.70	0.88	0.56	0.40	41,020	Medical Equipment Preparers	0.04	0.96	0.31	0.02	66,790
Political Scientists	0.77	0.87	0.53	0.39	5,580	Packaging and Filling Machine Op.	0.04	0.91	0.39	0.02	371,600
News Analysts, Reporters, Journalists	0.81	0.81	0.56	0.39	45,020	Machine Feeders and Offbearers	0.05	0.89	0.36	0.02	44,500
Mathematicians	0.91	0.74	0.54	0.39	2,220	Dishwashers	0.03	0.95	0.30	0.02	463,940
Technical Writers	0.83	0.82	0.54	0.38	47,970	Cement Masons and Concrete Finishers	0.03	0.92	0.39	0.01	203,560
Proofreaders and Copy Markers	0.91	0.86	0.49	0.38	5,490	Supervisors of Firefighters	0.04	0.88	0.39	0.01	84,120
Hosts and Hostesses	0.60	0.90	0.57	0.37	425,020	Industrial Truck and Tractor Operators	0.03	0.94	0.28	0.01	778,920
Editors	0.78	0.82	0.54	0.37	95,700	Ophthalmic Medical Technicians	0.04	0.89	0.33	0.01	73,390

## The Coming Disruption: The View from Microsoft

Table 5: SOC Major groups sorted by AI Applicability Score

Major Group	Coverage	Completion	Scope	Score	Employment
Sales and Related	0.56	0.89	0.51	0.32	13,266,370
Computer and Mathematical	0.64	0.86	0.48	0.30	5,177,390
Office and Administrative Support	0.56	0.89	0.49	0.29	18,163,760
Community and Social Service	0.51	0.88	0.44	0.25	2,216,930
Arts, Design, Entertainment, Sports, Media	0.59	0.80	0.49	0.25	2,039,830
Business and Financial Operations	0.49	0.89	0.47	0.24	10,087,850
Educational Instruction and Library	0.46	0.89	0.46	0.23	8,328,920
Architecture and Engineering	0.49	0.84	0.46	0.22	2,523,090
Personal Care and Service	0.39	0.90	0.45	0.20	2,959,620
Life, Physical, and Social Science	0.39	0.88	0.46	0.20	1,381,930
Food Preparation and Serving Related	0.32	0.91	0.43	0.18	13,142,870
Management	0.27	0.90	0.45	0.14	10,445,050
Protective Service	0.33	0.84	0.40	0.14	3,484,710
Legal	0.33	0.89	0.42	0.13	1,196,870
Healthcare Practitioners and Technical	0.25	0.91	0.39	0.12	9,251,930
Installation, Maintenance, and Repair	0.22	0.92	0.41	0.11	5,979,150
Production	0.23	0.91	0.41	0.11	8,419,460
Transportation and Material Moving	0.21	0.92	0.38	0.11	13,664,940
Building, Grounds Cleaning, Maintenance	0.15	0.94	0.38	0.08	4,403,350
Construction and Extraction	0.16	0.92	0.40	0.08	6,188,720
Farming, Fishing, and Forestry	0.11	0.92	0.39	0.06	422,740
Healthcare Support	0.13	0.90	0.38	0.05	7,063,540



## But is It Augmentation or Substitution?

### • Specific Occupations:

- Interpreters with the highest applicability score of .49?
- Substitution.
- How about Writers and Authors with a score of .45?
- Technical Writers, probably substitution.
- Creative Writers, possibly augmentation.



# Examples of Augmentation and Substitution

- **Augmentation: Air Traffic Controller.** AI processes flight data while leaving decisions to humans, keeping wages high.
- **Substitution: AI can increase the number of cases where a customers' problem can be solved without human involvement, lowering demand for humans and their wages.**

<https://www-economist-com/finance-and-economics/2025/02/13/how-ai-will-divide-the-best-from-the-rest>



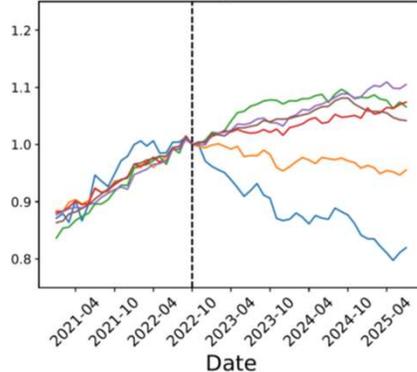
# Canaries in the Coal Mine?

Brynjolfsson, Chandar and Chen, August 26, 2025. Stanford economists systematic investigation of employment effects of AI using detailed payroll data from 1/21 to 7/25

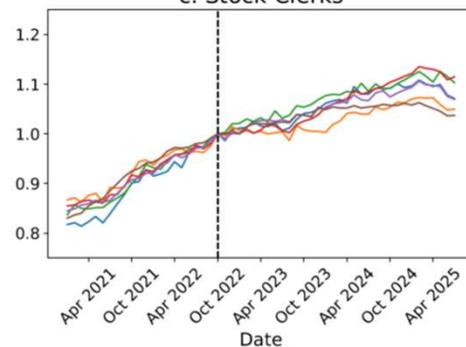
[https://digitaleconomy.stanford.edu/wp-content/uploads/2025/08/Canaries\\_BrynjolfssonChandarChen.pdf](https://digitaleconomy.stanford.edu/wp-content/uploads/2025/08/Canaries_BrynjolfssonChandarChen.pdf)



Headcount Over Time by Age Group Software Developers (Normalized)



c. Stock Clerks



— Early Career 1 (22-25)    — Developing (31-34)    — Mid-Career 2 (41-49)  
— Early Career 2 (26-30)    — Mid-Career 1 (35-40)    — Senior (50+)

## What Explains The Difference?

- **Remember Two Kinds of Knowledge?**
  - Codified knowledge: “book learning” from formal education
  - Tacit Knowledge: idiosyncratic tips and tricks that accumulate with experience.
- **What kind of knowledge is AI better at?**
- **What kind of knowledge is more important for a programmer; for a stock clerk?**
- **What kind of knowledge is more likely to be *augmented* by AI?**



## Wage Polarization with AI

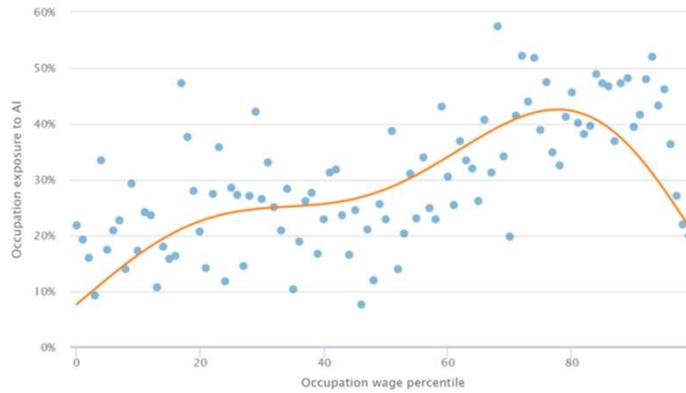
- **Early 21<sup>st</sup> Century Technology: Machines substitute for humans in *routine* work.**
- **AI Technology: AI substitutes for humans in work that requires *codified* skills.**
- **What is the difference?**
- **Ask a computer programmer.**
- **AI polarization will displace workers further up the traditional levels of skill.**



# One estimate of Possible Effects

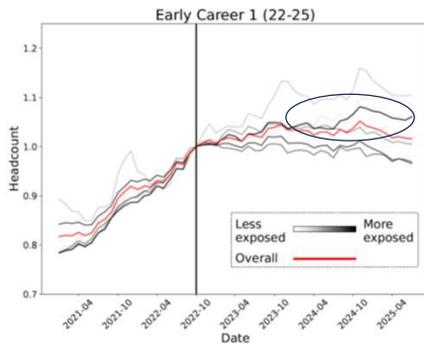
<https://budgetmodel.wharton.upenn.edu/issues/2025/9/8/projected-impact-of-generative-ai-on-future-productivity-growth>

Figure 2. Exposure to Generative AI by Annual Wage Percentile

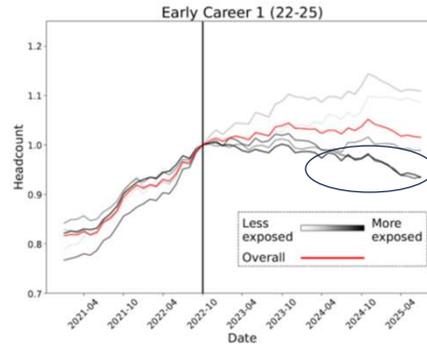


# Evidence of Augmentation?

AI Searches "Augmentative"



AI Searches "Automotive"



Brynjolfsson et al., "Entry-level employment has declined in applications of AI that *automate* work, with muted changes for *augmentation*."

## But, There is Some Evidence of AI Augmentation

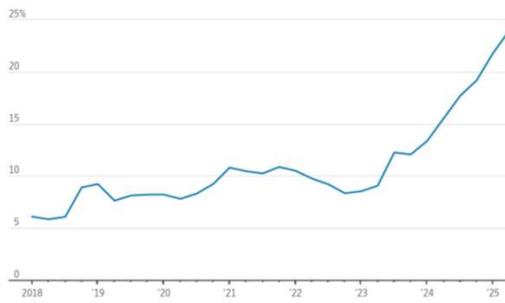
### These AI-Skilled 20-Somethings Are Making Hundreds of Thousands a Year

Companies are snapping up 'AI native' grads; 'under 25, you can be making a million'

By Katherine Blinley [Follow](#)  
Aug. 26, 2025 8:00 pm ET



Proportion of IT jobs requiring AI skills



Source: Anil K. Gupta, University of Maryland



NATIONAL ECONOMIC  
EDUCATION DELEGATION

45

## Brynjolfsson et.al. Conclusion

“The adoption of new technologies typically leads to heterogeneous effects across workers, resulting in an adjustment period as workers reallocate from displaced forms of work to new forms with growing labor demand (Autor et al., 2024). Such endogenous adjustment may already be happening with AI, with emerging evidence of shifts in college majors away from AI-exposed categories such as computer science (Horowitch, 2025). Past transitions such as the IT revolution ultimately led to robust growth in employment and real wages following physical and human capital adjustments, with some workers benefiting more than others (Bresnahan et al., 2002; Brynjolfsson et al., 2021).

Tracking employment trends on an ongoing basis will help determine if the adjustment to AI follows a similar pattern.”

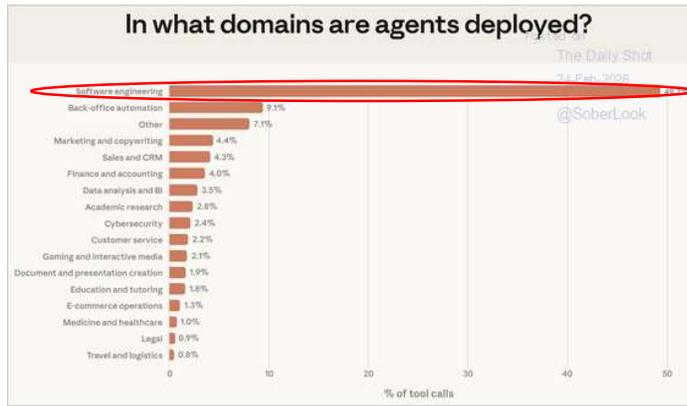
Optimistic or Pessimistic?



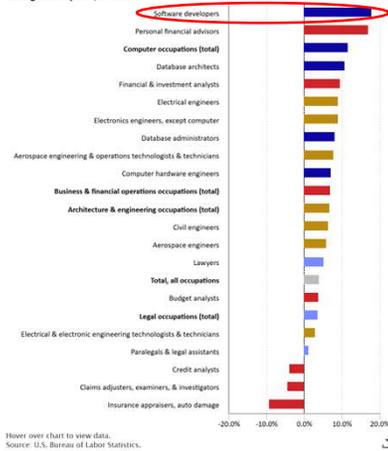
NATIONAL ECONOMIC  
EDUCATION DELEGATION

46

# But the Evidence is Contradictory!



Employment projections for selected occupations susceptible to potential artificial intelligence impacts, 2023-33



Source: @AnthropicAI

# Stock Market "Prediction"



## I Couldn't Say It Better

Yale Budget Lab, "Evaluating the Impact of AI on the Labor Market: Current State of Affairs," 1/28/2026

### Summary:

While anxiety over the effects of AI on today's labor market is widespread, our data suggests it remains largely speculative. The picture of AI's impact on the labor market that emerges from our data is one that largely reflects stability, not major disruption at an economy-wide level. While generative AI looks likely to join the ranks of transformative, general purpose technologies, it is too soon to tell how disruptive the technology will be to jobs. The lack of widespread impacts at this early stage is not unlike the pace of change with previous periods of technological disruption



## Suppose the Future of AI is a "Big Deal"

- Imagine that computer expertise *substitutes* for human expertise, so that the only work left for humans is unskilled and low paying
- But, the productivity of computers is so great that we live in a world of abundance.
- Keynes (1930) *Economic Possibilities for our Grandchildren*
  - I draw the conclusion that, assuming no important wars and no important increase in population [climate change?], the *economic problem* [scarcity] may be solved [in 100 years].
  - Thus, for the first time ...man will be faced with his real, his permanent problem-how to use his freedom from pressing economic cares, how to occupy the leisure..., to live wisely and agreeably and well.



## Problems with Keynes' Vision

- How do people lead meaningful lives without meaningful work?
- Given that the value of human skill is eliminated, how do we manage to share the abundance? Will the owners of AI resources be more like Bill Gates or Elon Musk?
- David Autor on a podcast has described the Musk case as a Mad Max scenario: “The more likely scenario to me looks much more like Mad Max: Fury Road, where everybody is competing over a few remaining resources that aren’t controlled by some warlord somewhere.” (<https://podcasts.apple.com/us/podcast/david-autor-on-ais-impact-on-jobs-expertise-and-labor/id1677184070?i=1000715406677>)



## Autor (and Neil Thompson)'s Hope

“Scenario 1: We can’t imagine the jobs of the future” (paraphrased)

The *augmentation* of human expertise can operate through several channels.

1. Technology creates demand for new human expertise, 60 percent of employment in 2018 was found in occupations that didn’t exist in 1940.
2. Many tools collaborate with experts. Brynjolfson et.al. found that AI-customer service tools substantially improve junior agents – by accelerating their path to mastery



## Author (and Neil Thompson)'s Fear

**“Scenario 2: Human Labor Loses all Scarcity Value”(Keynes’ vision)... A world without labor scarcity... would pose three surpassing social challenges...”**

- 1. A crisis of social organization and human purpose.**
- 2. A huge income distribution problem.**
- 3. How does democracy function without the perception that citizen voters both contribute to and benefit from economic activity.**



## “Hedging Our Bets” against Scenario 2

- 1. Universal Basic Capital (as opposed to Income) Grant: giving every person a meaningful ownership stake in productive assets at birth.**
- 2. Wage Insurance to support workers transitioning into different jobs.**
- 3. Using AI and artificial reality tools to enable displaced workers to master new expertise by doing (simulations) rather than studying.**



## I Hate to End Pessimistically

- How do we maintain “standards” in the face of fierce competition
- Anthropic and the Pentagon: No use of “Claude” for massive surveillance or autonomous lethal weapons.

## Let's Hear from You!

**Geoffrey Woglom**  
**grwoglom@amherst.edu**

**Contact NEED: [Info@NEEDEcon.org](mailto:Info@NEEDEcon.org)**

**Submit a testimonial:**  
**[www.NEEDecon.org/testimonials.php](http://www.NEEDecon.org/testimonials.php)**

**Support NEED: [www.NEEDecon.org/donate.php](http://www.NEEDecon.org/donate.php)**