AI and the Workforce

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Leader Schumer, Senators Rounds, Young and Heinrich, and distinguished members of the Senate thank you for the opportunity to join you to discuss artificial intelligence (AI) and employment and skills. I am Rob Atkinson, President of the Information Technology and Innovation Foundation (ITIF), a technology policy think tank.

While this is an important issue, ITIF does not believe that AI will produce drastic structural changes in the U.S. economy or labor markets. Change will likely be gradual and, if Congress take steps to improve America's labor market adjustment system, it will be manageable and positive.

DYSTOPIAN JOB PREDICTIONS ARE WRONG

Despite U.S. labor productivity growth and unemployment rates being near all-time lows, the prevailing narrative is that AI will lead to massive labor market disruption. A 2013 study by Oxford University researchers Carl Benedikt Frey and Michael Osborne set the tone when it concluded that 47 percent of U.S. employment was at risk of job loss from new technology.[1] Today a typical headline warns, "Is AI Coming for Your Job? 65% of Workers Are Worried."[2]

Some are even more distopian. Silicon Valley venture capitalist Vinod Kholsa states that "AI will be able to do within 10 years 80 percent of the jobs that we know of today."[3] Elon Musk is even more extreme: "AI will make jobs kind of pointless. Probably the last job that will remain will be writing AI software, and then eventually the AI will just write its own software."[4] Even AI "thinks" it will kill jobs. When one

study asked ChatGPT-3 to list the downsides for workers, it wrote: "Job Losses: One of the potential downsides of AI is that it could lead to increased unemployment as machines begin to replace human workers in a variety of industries."[5] Of course, the AI wasn't thinking; it was simply regurgitating articles scraped from the Internet that had this view.

There is nothing new about these kinds of claims. They have been made every time a new general purpose technology has emerged. President Coolidge's Secretary of Labor stated: "we must ask ourselves, is automatic machinery … going to leave on our hands a state of chronic and increasing unemployment?"[6] Four decades later President Kennedy worried that "I regard it as the major domestic challenge to maintain full employment at a time when automation, of course, is replacing men."[7]

We even have a long history of AI job panics. In the early 1980s, AI scientist Nil Nilson warned, "We must convince our leaders that they should give up the notion of full employment. The pace of technical change is accelerating."[8] It was not and is not.

The problem with these fearful speculations—besides the fact that they are not true—is that they fuel opposition to AI progress.

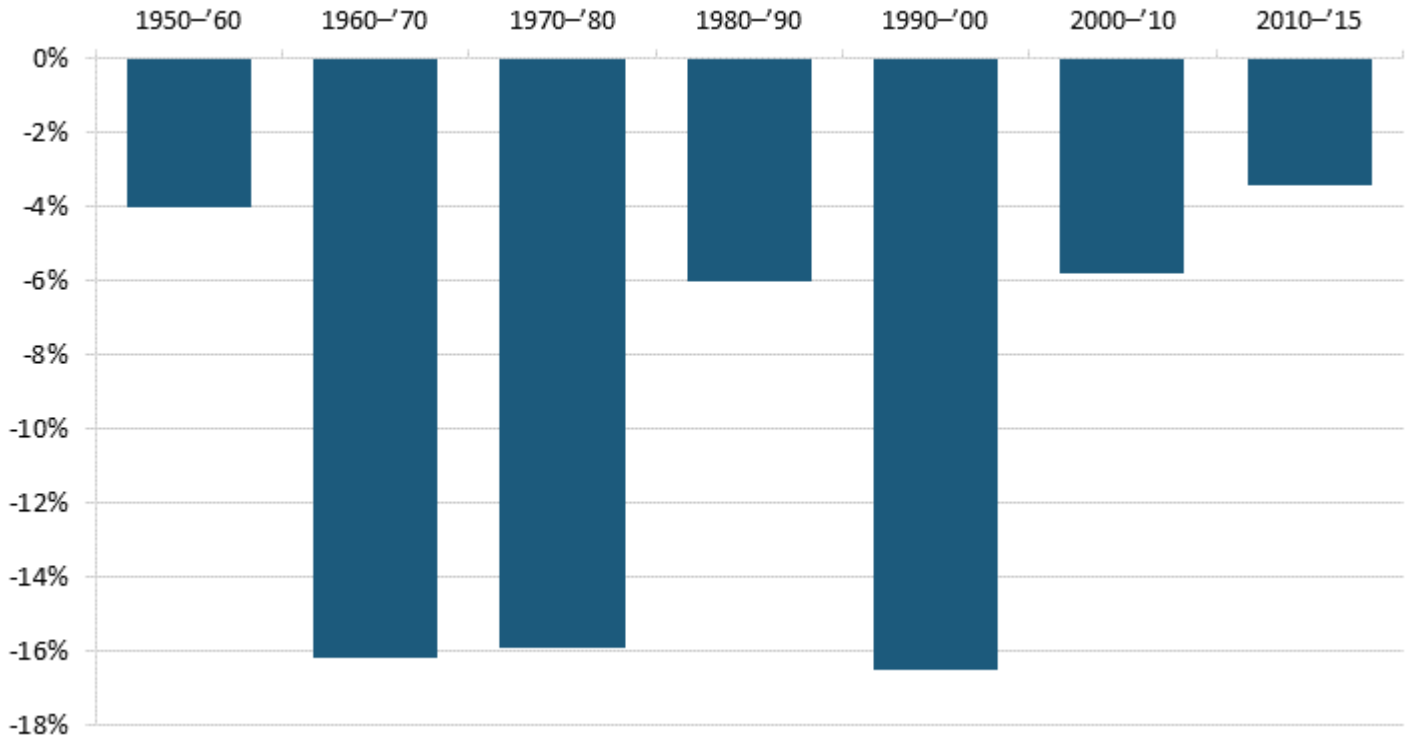
Indeed, a host of commentators have called for slowing the pace of AI, or even putting on the brakes. A recent *Vox* article was titled "The case for slowing down AI."[9] Elon Musk and others signed a statement earlier this year calling for a 6-month moratorium on AI research.[10] It's as if a collective panic has swept a large share of "experts."

EVIDENCE THAT TECHNOLOGICAL INNOVATION DOES NOT BOOST UNEMPLOYMENT

History, research, and logic suggest the AI techno-job panic is not warranted. In a study using Bureau of Labor Statistics data, ITIF measured the rate of job loss by occupations in recent decades (figure 1).

Interestingly, the rates in 1960s and 70s were relatively high compared to more recently, but it was those decades where real wages grew significantly, and millions of middle-class jobs were created.

Figure 1: Absolute job losses from occupational churn, 1950–2015[11]



While technology has always eliminated some jobs (e.g., buggy-whip makers), it has also created new jobs (e.g., automobile mechanics) and boosted living standards which have resulted in more demand for workers doing existing tasks (building houses, educating people, selling goods, etc.). Since 1900, U.S. productivity has increased by around 7 times: In other words, the average worker produces more in an hour than the average worker in 1900 produced in almost a full a day. But today's unemployment rate is no higher than back then. Indeed, from 1850 to 2023, employment grew at same rate as the labor force. That's because all those farmers, elevator operators, bowling pin setters, horse stable workers, and others found jobs doing other things. That's not to say that we can't have occasional periods of excess unemployment when the economy is in a recession for some reason (e.g., a financial crisis or a pandemic), but the rest of the time the Federal Reserve ensures full employment, even if AI is automating tasks.

This is why virtually all scholarly studies find no net negative effect on employment from technology-induced productivity gains. An OECD study summed it up, "Historically, the income-generating effects of new technologies have proved more powerful than the labor-displacing effects: technological progress has been

accompanied not only by higher output and productivity, but also by higher overall employment."[12]

The argument that AI will lead to high unemployment stems from what economists call the "lump of labor fallacy": the idea that there is a limited amount of work to be done, and if a job is eliminated, it's gone for good. But this is a false reading of the process of technological change because it fails to include second-order effects whereby the savings from increased productivity are recycled into the economy in the form of higher wages, higher profits, and reduced prices to create new demand that in turn creates other jobs—some in new occupations (like "content creator assistant") but most in existing occupations that workers will now spend more money on (e.g., personal trainer).

Studies at the firm and industy level find similar resuts. Babina et al. found that "Data on job postings reveal that firms investing in AI technologies increase their demand for workers with more years of education and workers with data analysis and IT skills."[13] Similarly, Albanesi et al. concluded that: "AI-enabled automation in Europe is associated with employment increases."[14]

Moreover, it's important to note that AI is neither magic nor sentient. There are vastly more things AI cannot do than it can do.[15] Yes, AI program DALL-E can generate cool pictures, but it can't create a robot that lays carpet.[16] Yes, ChatGPT-3 can write a wedding toast, but it can't take care of people in a hospital. Human work is incredibly complex, and there are vast array of tasks AI cannot do: fight a fire, repair plumbing, model clothing, give a manicure, install a house addition, be an airline steward, teach children, be a consultant, and even legislate.

The reason is simple: Machine learning and large language models are just software. Better than anything we have had before, to be sure. But there are limits to what they can do. But that doesn't stop the techno-panic based on the view that artificial general intelligence (AGI) is just around the corner. As MIT professor and Rethink Robotics CEO Rodney Brooks observed with respect to AI:

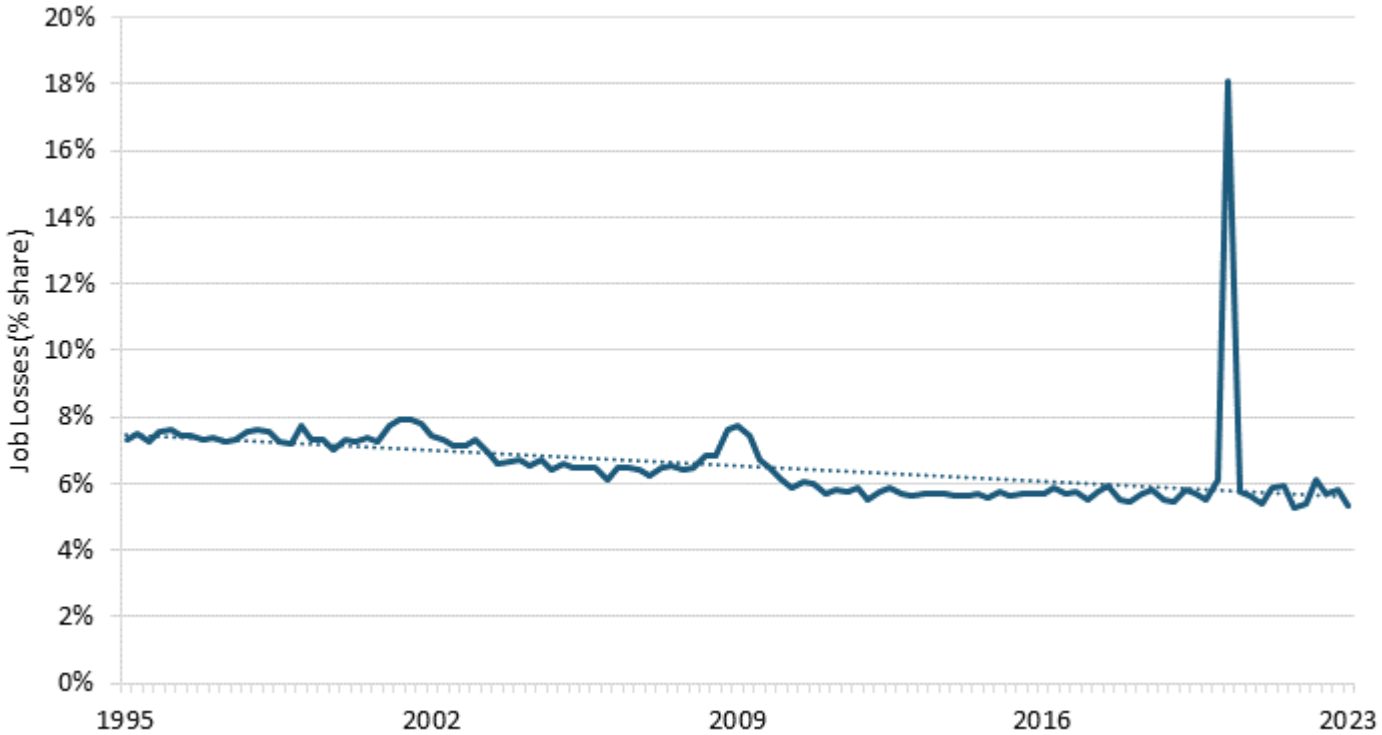
> Misled by suitcase words, people are making category errors in fungibility of capabilities—category errors comparable to seeing the rise of more efficient internal combustion engines and jumping to the conclusion that warp drives are just around the corner.[17]

Finally, many of the benefits from AI will not be greater effiency, but rather greater quality and innovation. AI can make K-12 education more customized to student needs. AI can boost drug discovery. AI can reduce financial fraud. These kinds of uses do not negatively impact employment.

WORKER DISLOCATION AND JOB QUALITY IMPACTS ARE LIKELY TO BE MODEST

But while higher unemployment is not in the cards, what about worker dislocation? Despite the hype about how transformative AI is, few companies today use AI in any significant way, and while that number will grow, the rate of adoption, like all other technologies in the past, is likley to be incremental. As such, annual rates of employment disclocation are likley to be modest at worst. It is interesting to note that the share of workers losing their jobs due to organizational downsizing or closures has been falling steadily since 1995 (with the exception of the covid spike in 2020). (See figure 2.) And the 1990s economy was seen as good for U.S. workers, even though the rate of job loss was higher than the last decade. The reason is simple. Workers are hurt far more by stagnation and stasis than they are by technology-driven productivity growth. The latter creates a virtuous cycle of higher wages/lower prices, more demand, and more jobs.

Figure 2: Quarterly job losses as a share of total employment[18]



What are the likely dislocation impacts on skill and income levels? In an analysis ITIF conducted in 2018 for the G7 AI meetings, we found that correlation between the average wage of an occupation and its risk of automation, including from AI, is negative and quite large (-0.52). The correlation between average years of schooling and risk of automation is also negative and large (-0.51). In other words, the lower the wage and skill level, the higher the risk of a job being automated. The highest-risk occupations have the lowest median wage ($32,380), while the next-highest have the second-lowest median wage ($34,990), and so on.19 But that analysis was conducted before the emergence of large language models. Deep learning and LLMs may have more of an impact on some knowledge jobs, particularly more routinized ones.

Finally, it's not clear the impact of AI on job quality. But the OECD recently reported that most workers reported an improvement in job quality from the introduction of AI into the workplace.20

WHAT SHOULD CONGRESS DO?

Rather than slowing AI development and adoption, policymakers should do everything possible to accelerate both, as AI is needed to compete with China and boost U.S. wage growth. And the goal should not be to slow or even stop AI-induced job loss, for the simple reason that the goal of U.S. technology policy should be to spur improvements in living standards for all Americans. For example, if an insurance company uses AI to automate claims processing and downsizes its workforce by 10 percent, the affected workers may be hurt. But the millions of customers of the insurance company will be helped through slightly lower insurance premiums. This means Congress should reject the advice of some who argue that only AI that complements workers should be supported, not AI that replaces workers.21 If we had followed that advice in the past, we'd still have telephone operators using better tools to manually switch calls and bank tellers entering in customer information on ATM machines. All AI applications that increase worker productivity are in the national interest, regardless of whether they complement or replace the worker.

So, rather than try to slow the rate of job dislocation from AI, Congress should craft policies that better help workers make employment transitions and be more prepared for an AI-driven economy. ITIF has laid out a detailed and actionable policy agenda to help workers better adjust to technology-driven labor-market churn.22 One

recommendation is to invest more in active labor market adjustment policies. In 2015, the United States ranked 33rd out of 34 nations in expenditures on labor market adjustment programs as share of GDP.[23] In addition, for workers who do get laid off from technology, the U.S. unemployment insurance system is often too parsimonious, depending on the state the worker is in. Congress could fix that by increasing the FUTA tax that all employers pay. Congress should also establish stronger requirements for state governments to let workers collecting unemployment insurance enroll in certified training without losing their benefits. In addition, workers need access to top-quality online reemployment portal that includes free online testing and counseling and career navigation services. Unfortunately, current federally supported state-based employment portals are very poor quality.

We also need to do more to prepare workers, especially lower-skilled workers, for transitions into new jobs and occupations. It is a problem that our K-12 schools and universities as a group significantly underperform in their job of ensuring students have the skills they need to thrive. As economist Manuel Trajtenberg wrote in a study about AI and jobs, "the skills employers desire and demand are poorly related to the competencies taught in school. Employers want workers with strong analytical, creative, and adaptive capabilities, which are competencies few secondary or collegiate schools impart."[24] This is one reason why U.S. workers' digital skills are lacking, especially compared to other advanced economies.[25]

One place to start is high school, where STEM curricula have remained largely unchanged for a century. It is striking that 87 percent of U.S. high school students pass a geometry class, but just 7.7 percent pass statistics.[26] In a data- and AI-driven economy, stats are more important than geometry. Even worse, just 6 percent of high school students take computer science courses. In 2018, just 1 percent of high school students took an AP computer science course.[27] And only 53 percent of U.S. high schools even teach computer science.[28] In contrast, in 2013, 87 percent of high school students took art.[29]

There are several reasons for this, but one is that there is no room in most students' class schedule for stats or CS, as states have crammed on more and high school graduation requirements. But why require biology, chemistry, and physics, but not CS? Why require three or four years of math, but not allow statistics to count toward that requirement? And why do many state universities not count statistics toward math entry requirements? While the federal government does not have direct control over

high school and college curricula, it can use incentives to encourage both colleges and high schools to make needed changes.[30]

We need more students to go to career and technical colleges and fewer to get liberal arts degrees from four-year colleges. But we also need a new kind of employer-relevant college focused on ensuring students learn skills employers value, such as business-oriented writing, reasoning and critical thinking skills, statistics, public speaking, computer science, and other related skills. One example of this model is the Harrisburg University of Science and Technology, a private university focused on responding to the needs of employers in the region for workers educated and trained in applied science and technology-related fields. The university provides degrees in areas such as Analytics, Interactive Media, and Geospatial Technology. Another model is the Canadian system of Polytechnics, publicly funded colleges or institutes of technology that offer four-year degrees, advanced two-year diplomas, certificates, and in-class training for apprenticeships.

In summary, the United States needs to lead the world in the development and adoption of AI. If we can do that, in part through supportive policy and not restrictive regulations like the EU is introducing, U.S. workers will benefit significantly, especially if Congress makes the needed workforce and education policy changes.

Thank you for your consideration.

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