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Artificial Intelligence, Robotics, and the Future of Work: Myths and Facts

BY ROBERT D. ATKINSON | SEPTEMBER 19, 2017

Editor's note: *Atkinson spoke about opportunities and challenges associated with artificial intelligence on March 23, 2017 at a conference hosted in Brussels by Bruegel, a European economic think tank specializing in economics. This essay is adapted from his remarks* (http://bruegel.org/events/artificial-intelligence-challenges-and-opportunities/).

We are in the midst of an unprecedented 4th Industrial Revolution that according to Klaus Schwab, founder and chairman of the World Economic Forum (WEF), "will affect the very essence of our human experience." Powered by artificial intelligence, autonomous vehicles, robots and other breakthroughs, these changes will come at us at rates that made the Industrial Revolution look like a period of stability. We are already seeing this shake the very foundations of our economies, with labor productivity growth rates skyrocketing, while rates of worker dislocation, the lion's share powered by technology, is growing.

And the pace of dislocation will only increase. One leading artificial intelligence scientist predicts that "in from three to eight years, we will have a machine with the general intelligence of an average human being." AI scientist Nil Nilson warns that "We must convince our leaders that they should give up the notion of full employment. The pace of technical change is accelerating." Labor economist Gail Garfield Schwartz predicts "With AI, perhaps as much as 20 percent of the work force will be out of work in a generation." Schwab's WEF warns that 5 million jobs will be eliminated worldwide by 2020 by robotics and AI. And Oxford researchers Osborne and Frey predict that 47 percent of U.S. jobs will be eliminated in 20 years. Some even warn that sex workers could be out of work as people prefer the intimacy (and lower price) of robots.

As a result, it is incumbent on policymakers to take two key steps: First, slow down to a more manageable pace of change by imposing a tax on robots. If robots do work, then make them pay Social Security taxes. This is an idea that has been championed by luminaries such as Bill Gates and French Socialist presidential candidate Benoit (http://www.apple.com/)Hamon (http://www.apple.com/), with Gates arguing, "You ought to be willing to raise the tax level and even slow down the speed" of automation and Hamon stating that, "When a worker is replaced by a machine the wealth creates benefits for the shareholders. I propose, therefore, to tax this wealth—by applying the social contributions on the whole of the added value and not just on the work." And second, we need to institute a system of universal basic income for all adults so that the increasing share of people who will be unemployed will be able to sustain themselves.

Okay, if you are a regular reader of ITIF's work you are probably scratching your head in wonder ("what has gotten into these guys?") or you are thinking rightly that we are just kidding. We are just kidding. Everything I wrote above is not just wrong, it's really wrong and this kind of neo-Luddite scaremongering should be rejected root and branch.

Let's start with productivity rates. Actually, since 2008, U.S. productivity growth averaged 1.2 percent, which was half the rate from 1995 to 2008. Similar slowdowns are going on around the world. And the risk of a U.S. worker losing their job from a shutdown or downsizing is the lowest it has been over last two decades, 20 percent lower than two decades ago. If there were a so-called 4th Industrial Revolution, then both rates would be up, not down.

But what about these predictions by experts? Surely, they must be right. Well, not unless you think they just missed it by 40 years, since many of these "predictions" were made in the 1970's and 80's. The machine with human intelligence within the next three to eight years' prediction was made by MIT scientist Marvin Minsky in 1970. The prediction about 20 percent of the workforce out of work was made in 1982. The call to give up on full employment was in 1984.

What about the more recent predictions, like WEF's and Oxford's? WEF's predication of 5 million jobs lost from robots is only scary if someone can't distinguish between millions and billions. Given that there are 3.4 billion workers in the world, losing 5 million jobs means that, wait for it, a whopping 0.033 percent of jobs will be destroyed by technology every year, or 1 out of every 3,003 workers. I'd have almost as much chance of winning the lottery as I'd have of losing my job to robots and AI. So, if I were you, I wouldn't worry about robots, I'd worry that your CEO is incompetent. For the risk of losing your job from your firm going out of business or downsizing in the next five years is more like 1,500 times greater than losing it to a robot. Maybe robots replacing CEO's is the answer to job security.

But what about the Oxford study by Osborne and Frey that warns of 47 percent job loss from technology? That is recent and a big number. This study has such a big number (but not a number so big as to seem unreasonable) that it is quoted in virtually every story on robots and jobs. Here's a test for you: Go to your favorite search engine and type in the news search category "robots and jobs" and see if the first article you find quotes them. I did it at 3:07 PM EST, August 28, 2017, and I won; the first article, "The Rise of the Machines (https://www.wired.com/brandlab/2015/04/rise-machines-future-lots-robots-jobs-humans/)," had

as its lead sentence the following: "Oxford University researchers have estimated that 47 percent…" (Maybe this could be a good drinking game: Every time an article cites the Oxford study, you have to drink a shot of Jack Daniels.)

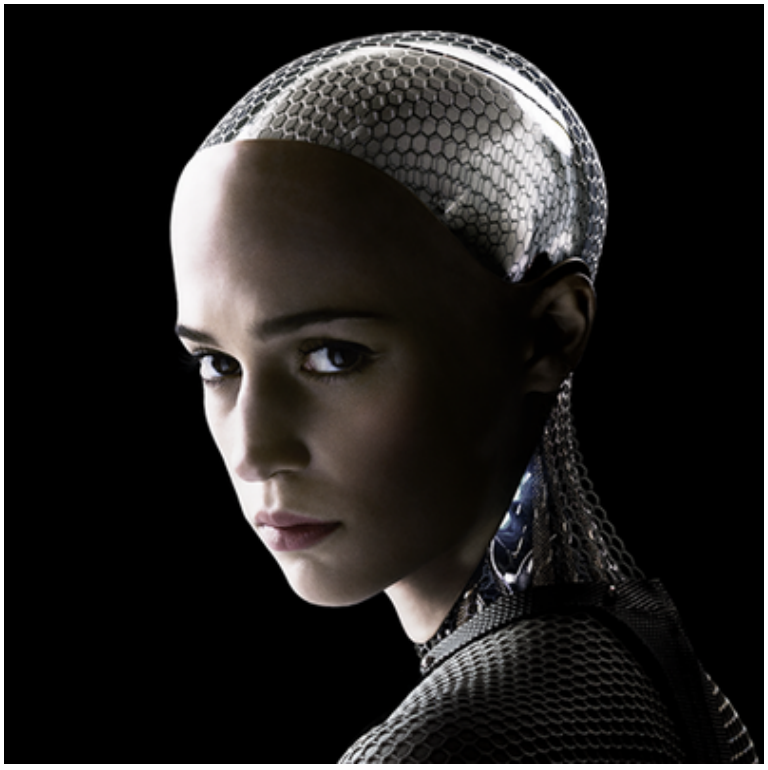
Well, the first thing you have to know about coverage of the Oxford study is that I am willing to wager a bottle of Jack Daniels that no reporter has bothered to read the appendix. If they did, they'd say "what the *@#$X!?" For the authors, who didn't submit their work for peer review, neglected to examine all 702 occupational categories and assess how likely it is that technology will substitute for a human worker in each case. Instead, they took a shortcut: They simply relied on task measures from the Department of Labor, which assessed occupations based on factors such as how much manual dexterity and social perceptiveness an occupation requires. And if the risk score of automation was above 0.7, ipso facto, the job was destined for the trash heap of techno-history. The only problem is that their methodology produces nonsense. Tell me how robots are going to send fashion models, manicurists, carpet installers, and barbers the way of the buggy whip maker, as they suggest. Is Versace really going dress up cute robots in his latest dresses and parade them down the runway? Are we going to be in a *Jetsons* world where you sit down in the magic robot chair and you get your hair cut automatically? When ITIF analyzed these 702 occupations manually, using a very generous assumption about how tech could eliminate jobs, we estimated (https://itif.org/publications/2017/08/07/unfortunately-technology-will-not-eliminate-many-jobs) that about 10 percent of jobs were at risk of automation, at most.

So instead of fretting about tech killing jobs, we should instead be worrying about how the heck are we ever going to raise productivity growth rates, which have been at all-time lows over the last decade. Of the over 700 U.S. occupations, here's a random selection of seven: brick masons and block masons; machinists; cartographers and photogrammetrists; dental laboratory technicians; social science research assistants; firefighters; and preschool teachers. Hard to see how robots are going to replace any of these jobs, with the possible exception of brick masons.

So we should we all calm down and not panic over the robot assault. Here's why: First, technological change has always been gradual and always will be. It's not like we will wake up one day and robots will be able to do everything. As MIT professor and CEO of Rethink Robotics Rodney Brooks writes, "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." Beam me up, Scotty.

Second, most of these techno-utopians/dystopians base their "predictions" on the continuation of Moore's law, the observation made by Intel's co-founder over 50 years ago that computing power would double every 25 months or so. But Moore's law is not a law. In fact, processor speed increases are slowing, while transistors able to be purchased per dollar are actually decreasing. Even Gordon Moore says his law "can't continue forever. The nature of exponentials is that you push them out and eventually disaster happens." Disaster will happen long before we get to the alluring robot in *Ex Machina*.

There's another reason to calm down. That is because, historically, there is no relationship between higher productivity and unemployment. This is pretty obvious if you just think about it. Productivity leads to lower prices and/or higher wages. This money gets spent. That spending creates jobs.



Plus, lots of these technology applications won't be to replace workers, but to augment them. AI will help doctors make better diagnoses and treatment decisions; it won't replace doctors. AI will help executives save some time. But you won't have the CEO of XYC corporation by Fred your friendly robot.

So, if we are to panic, and panic can be a good thing, then we should be panicking THAT WE WONT HAVE ENOUGH PRODUCTIVITY. For given the massive retirement of baby boomers, we have to raise productivity growth rates if we don't want a generational war where either the old people or the younger workers will win. For example, in Europe the ratio of working-age people to old people today is 3.5, and it is projected to drop to 2.2 by 2040. Productivity would have to increase 13 percent just to keep workers from seeing declines in after-tax incomes. And that doesn't account for the need to keep increasing productivity to raise incomes.

There is a final reason to relax, and it's that human needs are far from being satisfied. Ask the average American household today if they would have any problem spending extra money if productivity gains increased their incomes from $60K to $240K, and I pretty much guarantee you that most, except for a few simple-living hippies, would say, "No problem, man." People would go on more vacations, go to more concerts, afford better health care, eat out more, send their kids to college, pay more taxes so we can beautify our cities and towns and lower class size in schools. Our needs are very large and it is farfetched to think technology will eliminate the need for work.

All this is not to say we can't and shouldn't do better to help workers adjust, for some workers will lose their jobs to technology. (It just won't be overwhelming share.) We need better workforce training systems and worker adjustment programs (like unemployment insurance). But one innovation that is absolutely not needed is UBI (Universal Basic Income), which some have suggested as a response to technological progress, and which has to rank as one of the dumbest ideas of all time. The logic goes, "Let's pay people not to work because we are afraid people won't work." Huh? Let's instead keep the faith and support progress and technological change, especially with AI and robots, because without that our kids will be stuck with the same standards of living we have, not a materially improvement.

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