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ARTIFICIAL INTELLIGENCE

ChatGPT is about to revolutionize the economy. We need to decide what that looks like.

Whether it's based on hallucinatory beliefs or not, an artificial intelligence posit that boosters and skeptics agree on is that it will drastically increase productivity. But how? Economists have been generous. It could be like the Internet, like developers, venture backed startups, and some of the world's larger companies out of something it made sense of the moment it came into prominence and adopted by OpenAI San Francisco.

But while companies and economies are a closer chance to talk to, the likely impact of the technology on workers and the economy on the whole is far murkier. Will it be like the Internet, like blockchain, like something else? Will it replace workers, or will it make them more productive? Will it be the product of astounding all sorts of risks that companies will have to mitigate, or will it be a mere productivity-enhancing tool, comparable to automating spell-checking and calculating data. That has left economists unsure how jobs and overall productivity might be affected.

For all the amazing advances in AI and other digital tools over the last decades, economic growth has been disappointingly slow. Economists have proposed many explanations, including that companies and entrepreneurs have become more risk-averse, people haven't benefited, have been weren't been assessment of their jobs.

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Productivity growth, which is how countries become richer and more prosperous, has been dismal since around 2005 in the US and in most other countries since the 2008 financial crisis. Economists, as a group, are uncertain as to exactly what has led to stagnant wages for most people.

What productivity growth there has been is that it has largely confined to a few sectors, such as information sector, and in the US to a few cities—Silicon Valley, San Francisco, Seattle, and Boston.

Will ChatGPT make the already troubling income and wealth inequities in the US and many other countries even worse? It could a lot if it didn't, but provide a much-needed boost to productivity?

ChatGPT, with its human-like writing abilities, and OpenAI's other recent releases (DALL-E 2, which generates images from text, and Whisper, which transcribes speech) raises a number of ideas. The same is true of rivals such as Claude from Anthropic and Bard from Google, and of open-source models such as Stable Diffusion and GPT-J. Even Openai's, which ChatGPT is based on, or Google's competing language model LaMDA, which powers Bard, have created quite a recent stir.

They have getting more powerful that be trained on more data—a process that requires increasing amounts of computers in the months that go modular—is being dramatically. Further this month, OpenAI released its new version GPT-4. Its first version, released last November, was based on GPT-3. It has been trained on a much larger, 570 billion gigabyte text data set that about 500 times larger than GPT-3.

But it was the release of ChatGPT late last year that changed everything for many users. It's incredibly easy to use and compelling in its ability to rapidly create human-like text, including recipes, workout plans, and poems, and computer code in response to a few lines of prompt. Adding a growing number of entrepreneurs and businesspeople, the sum literally chat model—less abstract and more practical than the impressive but often hard-to-use-or-see-the-point-of-it-in-practice-for-most-people GPT-3—has left companies over the last few years—to dear evidence that the AI revolution has and pretend.

Venture capitalists and other investors are pouring billions into companies based on generative AI, and the list of apps and services driven by large language models is growing longer every week.

Among the big players, Microsoft has invested a reported $10 billion in OpenAI and ChatGPT, hoping the technology will eventually be integrated into its Bing search engine, which currently lags far behind Google in US office products. In early March, Salesforce launched a version of its customer relationship management platform, called Einstein GPT, that is powered by ROSS artificial large language models from Google Cloud. Adobe, which has been slow to roll out its own AI-powered tools, has recently added a few features powered by Stable Diffusion.

Meanwhile, Google is anticipated to soon roll out its own generative AI tools for Cloud. Dozen, and some of its other widely used products.

Still, there are no obvious killer apps yet. And as businesses scramble for ways to use the technology, economists say a year window has opened for exploiting how to get the most benefits from the new generation of AI.

Will ChatGPT make the already troubling income and wealth inequities in the US and many other countries even worse? Or could it help?

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"We're talking to such a massive because you can reach this technology. You can just plug with it without needing any coding skills. You can of people can start imagining how this impacts their workflow, their job prospects," says Katya Klinova, the head of research on AI ethics and the economy at the Partnership on AI in San Francisco.

The question it refers to going to benefit? And who will be left behind? says Klinova, who is working on a report outlining the potential impacts generative AI might have on employing recommendations for using it responsibly and ethically.

The optimistic view, it will prove to be a powerful tool for many workers, improving their capabilities and expertise, while providing a boost to the overall economy. The pessimistic one: companies will simply use it to replace workers, and the productivity benefits will accrue to a handful of massive corporations and tech-savvy elites, and high-tech unemployment will such effect will grind even richer, but it will do little for overall economic growth.

Helping the hand skilled

The question of ChatGPT's impact on the workplace isn't just a theoretical one.

In the most recent analysis, OpenAI's Tyna Eloundou, Sam Manning, and Pamela Mishkin, with the University of Pennsylvania's Daniel Rock, found that about 80% of the US workforce could have at least 10% of their tasks affected by the AI technology. They further estimated that 19.10 models, including GPT-4 and other anticipated software tools, would heavily affect 19% of jobs, or about 25 million jobs, in the US economy. The jobs in question, they said, are in a wide variety of occupations, higher-income jobs would be most affected, their impact, home of the jewels whose jobs are most vulnerable to AI, and the jobs that will be affected positively or negatively overall—jobs in part, you were thinking of a career change, blockchain engineers.

There is no question that lawyerly AI is going to be used—it's not just a novelty," says David Autor, an MIT labor economist and a leading expert on AI and its impact on workers. "Law firms are already using it, and they will use it more extensively. It opens up a range of tools that can be combined."

Autor's hope is that generative AI can be a powerful tool for many workers, helping them to do more and better work. Not everyone is an expert at using it, he says, but it can be a powerful tool for those who have the skills and expertise. It opens up the possibility that workers with less education and expertise can take on more difficult, higher-value tasks.

One of the data visualizations Midjourney does on the Midjourney interface of ChatGPT suggests that such outcome might be possible.

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Two MIT economists, graduate students, Shakked Noy and Whitney Zhang, ran an experiment involving hundreds of college-educated professionals working in ones like marketing and HR, they asked half to use ChatGPT to complete assigned writing tasks. The ones who used ChatGPT finished their work on the assignment, but here's the really interesting result: the AI tool helped the least skilled and accomplished workers the most, decreasing the amount of time they spent on the assignment by 40% and increasing the quality of their factors. the good science, simple and a little funny.

The professional bookings suggest that ChatGPT and other generative AIs could in the language of economists "upskill" people who are not highly skilled. Noy and Zhang, two of experienced workers "bring labor" (slip and fall) and other economists have proposed that generative AI could do the opposite, forcing some AI generative AI can be used as a potential tool that threaten their expertise and provide them with the specialized skills necessary to pose such a threat to such an outcome, which there is no evidence yet, AI could substitute not workers.

Concerning which scientists who will require a more difficult effort to think about how we want to exploit the technology.

"I don't think we should take it as the technology is here and we have to use it in the way it is," says Klinova. "We have a process of being created, it can be used and shaped in a variety of ways," says Autor. "It's hard to overstate the importance of imagining what it's done for."

Simple yet, we are at a moment where either how shifted workers will be able to use generative AI to their advantage, or how companies will use it to the most injurious technology workers will actually scale up the existing advantages over enormous sites. Which outcome we get depends in part on the choices companies make with ChatGPT, the decisions governments will make and regulate.

Beyond human ideas

There are some reasons to be pessimistic. Instead, Cat acting, in "The Economics of Artificial Intelligence: Governance and Incentives," the Stanford economist Erik Brynjolfsson argued that AI companies have obsessed with mimicking human intelligence rather than looking ways in which AI might be or other models do do new tasks and extend their capabilities.

The pursuit of human-like capabilities, Brynjolfsson argued, has led to developers training AI systems that people with machines, among them larger scale and exploiting inequities of wealth and income. It, he wrote, "this single bigger comparison" for the rising concentration of wealth.

A year later, he says ChatGPT, with its ability to mimic human speech, "is a prime, ahead by what I wrote ahead." It has "turbocharged" the discussion about the technology and the ways it can be used to augment rather than replace workers.

ERIK BRYNJOLFSSON
MELISSA MOSELEY/MIT IQ WEEKLY

Despite his worries that AI developers have been too focused on mimicking humans the capabilities to their creations, Brynjolfsson, like director of the Stanford Digital Economy Lab, now argues that generative AI could be a powerful tool for augmenting human capabilities. Instead of using it to replace workers, he argues, companies could use it to boost their productivity by giving them tools to do their jobs more productive.

Could the same thing happen with AI? Are ChatGPT, an economist at the University of Toronto, and others in doubt on whether we can figure out how to use the latest generation of artificial intelligence to do the job of another computer use.

So far, he says, companies have just been dropping in AI in the same jobs he knows "AI is most efficient." It's angry inconsistently increase productivity—that ultimately, the net benefit to the economy is zero. It's like a factory that installs a robot to do one of the tasks on an assembly line but then decides to stick with a human because it is able to do always does a little better or better with cheaper. It might also be in a case that generative AI could be a tool to complement.

The verdict on when—even if—that will happen with generative AI remains uncertain. "There we figure out some good writing, or, such others indentures in the differently, or—in the context of AMD's, what graphic design," he says. "We don't know. We don't have the institutional experience like the productivity boom," Goldfarb says. That it has to not work or test year or 10 years from now, I have no idea."

Power struggle

When Sarina Bunnell, an accountant at the University of Virginia and a member of the bargaining committee for the United Association of Journeymen Plumbers and Pipefitters, first heard about ChatGPT, she did what most of the rest of us did: she began playing around with them to see how they might help her work. She carefully fed the tax code into the system and asked it questions about it. She tested it on the kinds of questions she fielded from her colleagues and students, and she found the answers it gave back were pretty good. It seemed to be doing a pretty good job, she said, of "taking complex tax code and making it simple."

Bunnell's initial reaction was that the technology could be a powerful tool for her and her colleagues. But she also worried that it could be used by her employer to cut her hours or even lay her off. She and her colleagues are in the middle of negotiating a new contract with the university, and they have made it clear that the impact of AI on their jobs is a major issue.

"Who will control the future of this technology?"

The potential of large language models is already being discussed by workers and their unions. Last month, Hollywood's writers, for example, demanded that the Hollywood studios make it clear that they will not use AI to write scripts or to use writers' work to train AI models. Hollywood's writers are on strike, and it is not clear when they will return to work.

Unions in other sectors, such as the UAW, which represents about 150,000 workers, mostly at the Big Three auto and parts companies, have also been discussing the impact of AI on their members' jobs. Bunnell's union, the United Association, which represents about 350,000 workers in the plumbing, pipefitting, and related professions, is also considering the issue.

Bunnell's union, which represents workers in a variety of fields, including plumbers, pipefitters, and HVAC technicians, has been discussing the impact of AI on its

Simon Johnson and Daron Acemoglu

STEPHEN JAFFE/IMF VIA GETTY IMAGES, JAROD CHARNEY/MIT

From the decades after World War II until the early 1970s, the US economy was marked by rapid technological changes; wages for most workers rose while income inequality dropped sharply. The reason, Acemoglu and Johnson say, is that technological advances were used to create new tasks and jobs, while social and political pressures helped ensure that workers shared the benefits more equally with their employers than they do now.

In contrast, they write, the more recent rapid adoption of manufacturing robots in "the industrial heartland of the American economy in the Midwest" over the last few decades simply destroyed jobs and led to a "prolonged regional decline."

The book, which comes out in May, is particularly relevant for understanding what today's rapid progress in AI could bring and how decisions about the best way to use the breakthroughs will affect us all going forward. In a recent interview, Acemoglu said they were writing the book when GPT-3 was first released. And, he adds half-jokingly, "we foresaw ChatGPT."

Acemoglu maintains that the creators of AI "are going in the wrong direction." The entire architecture behind the AI "is in the automation mode," he says. "But there is nothing inherent about generative AI or AI in general that should push us in this direction. It's the business models and the vision of the people in OpenAI and Microsoft and the venture capital community."

If you believe we can steer a technology's trajectory, then an obvious question is: Who is "we"? And this is where Acemoglu and Johnson are most provocative. They write: "Society and its powerful gatekeepers need to stop being mesmerized by tech billionaires and their agenda . . . One does not need to be an AI expert to have a say about the direction of progress and the future of our society forged by these technologies."

The creators of ChatGPT and the businesspeople involved in bringing it to market, notably OpenAI's CEO, Sam Altman, deserve much credit for offering the new AI sensation to the public. Its potential is vast. But that doesn't mean we must accept their vision and aspirations for where we *want* the technology to go and how it should be used.

According to their narrative, the end goal is artificial general intelligence, which, if all goes well, will lead to great economic wealth and abundances. Altman, for one, has promoted the vision at great length recently, providing further justification for his longtime advocacy of a universal basic income (UBI) to feed the non-technocrats among us. For some, it sounds tempting. No work and free money! Sweet!

It's the assumptions underlying the narrative that are most troubling—namely, that AI is headed on an inevitable job-destroying path and most of us are just along for the (free?) ride. This view barely acknowledges the possibility that generative AI could lead to a creativity and productivity boom for workers far beyond the tech-savvy elites by helping to unlock their talents and brains. There is little discussion of the idea of using the technology to produce widespread prosperity by expanding human capabilities and expertise throughout the working population.

Companies can decide to use ChatGPT to give workers more abilities—or to simply cut jobs and trim costs.

As Acemoglu and Johnson write: "We are heading toward greater inequality not inevitably but because of faulty choices about who has power in society and the direction of technology . . . In fact, UBI fully buys into the vision of the business and tech elite that they are the enlightened, talented people who should generously finance the rest."

Acemoglu and Johnson write of various tools for achieving "a more balanced technology portfolio," from tax reforms and other government policies that might encourage the creation of more worker-friendly AI to reforms that might wean academia off Big Tech's funding for computer science research and business schools.

But, the economists acknowledge, such reforms are "a tall order," and a social push to redirect technological change is "not just around the corner."

The good news is that, in fact, we can decide how we choose to use ChatGPT and other large language models. As countless apps based on the technology are rushed to market, businesses and individual users will have a chance to choose how they want to exploit it: companies can decide to use ChatGPT to give workers more abilities—or to simply cut jobs and trim costs.

Another positive development: there is at least some momentum behind open-source projects in generative AI, which could break Big Tech's grip on the models. Notably, last year more than a thousand international researchers collaborated on a large language model called Bloom that can create text in languages such as French, Spanish, and Arabic. And if Coyle and others are right, increased public funding for AI research could help change the course of future breakthroughs.

Stanford's Brynjolfsson refuses to say he's optimistic about how it will play out. Still, his enthusiasm for the technology these days is clear. "We can have one of the best decades ever if we use the technology in the right direction," he says. "But it's not inevitable."

by David Rotman

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