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Innovation at the Speed of AI

Remarks by

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Thank you for the opportunity to speak to you today about artificial intelligence (AI).[1] AI is a powerful and rapidly advancing technology that has captured everyone's attention. If you've watched enough sci-fi, you know that major technological change is usually either dystopian or utopian—the robots either take over the world or improve it. These polarized views are also common among economists and technologists. On one side, there are the doomers—those convinced that new technologies will destroy jobs, widen inequality, and concentrate power. On the other, there are the techno-optimists—those convinced we're on the brink of an unprecedented leap in productivity, growth, and creativity if we let the technology proliferate. As usual, the truth about AI is probably somewhere in between. The job of an economic policymaker is to separate hype and hyperbole from hard data and sound analysis and understand what AI really means for growth, productivity, and the broader economy.

I will focus on three aspects of major technological change that "repeat" through history. First, technological change is a constant in our lives, and it is almost always disruptive. It upends the way we work and socialize. Second, it alters existing power relationships in unsettling ways. Finally, technological change reliably raises productivity and our standard of living while improving the quality of our lives. My intent is to describe how AI is likely to affect our lives along these lines and how it differs from past technological changes.

We have always had technological changes that dramatically transform the economy and our daily lives. In the 1880s, electricity was a curiosity reserved for a few wealthy urban people and some limited industrial uses. By 1920, half of homes had

[1] The views expressed here are my own and are not necessarily those of my colleagues on the Federal Reserve Board or the Federal Open Market Committee.

electricity, by 1940 nearly half had a refrigerator, and by 1945, 85 percent of homes were electrified. Automobile use also rose swiftly. Auto registrations rose from 140,000 in 1906 to 23 million in 1929, at a time when the total number of households was fewer than 30 million. These advances changed daily life in profound ways. Another aspect of technological change is the speed at which new technologies are being adopted. In the last 50 years, we've experienced adoption of new technologies twice as fast: Personal computers were widespread within 20 years—the internet in 12 years—and it only took 6 years for smartphones to be universal. And now AI is moving even more rapidly. I tend to believe that the transition for workers affected by AI will be accelerated also, but no one really knows. Such predictions are certainly beyond my powers as an economic policymaker, so I will limit myself to the here and now. The point of this discussion is that technological change is a constant in our lives—it is always happening and will continue to happen—and AI seems to be following the pattern of ever-faster adoption and change.

Although it is a constant in our lives, technology also disrupts our lives every time a new innovation appears. The way that we work and produce changes. Jobs disappear, and new ones appear. Our social lives are disrupted as well, often in good ways—but sometimes not so good. We used to write letters and mail them to communicate with loved ones. This took time and was expensive. Now we text or use FaceTime or Zoom to communicate with friends and family members anytime. This makes it easier to maintain relationships across geography and time. But it can also undermine those social connections. When I walk into a party and see half of the people there staring at their screens, I can see that technology can lead to less social interaction, not more.

Technological disruption, like anything else, has benefits and costs. But, as I will argue later, I believe that we need to let this disruption occur to recognize the benefits alongside the costs, to enable us to lead better lives.

My second point was that technological innovation can alter power relationships in profound ways. When Gutenberg invented the printing press, he took away the Catholic Church's power over the written word and democratized it. When personal computers appeared, power shifted from those who managed mainframes to individual users. When the internet arrived, the control of news, information, and opinion pieces shifted from major news outlets to anyone with a webpage. AI will do the same. It will take power from "experts" and shift it to "nonexperts." Much like Gutenberg's printing press, AI will likely democratize expertise. Tools that once required specialized training are already becoming accessible to a much wider range of people. We see this happening with software coding already. A nurse using an AI diagnostic tool or a technician relying on a generative model to troubleshoot complex equipment can perform higher-order tasks more efficiently. It will likely do the same for scientific discovery. Those who collected economic rents, or excess payments, from the control of power will lose those rents. But this will improve our lives in the process.

Whenever a new technology emerges, the first question economists get is about jobs: Will this replace people or make them more productive? The challenge is that, with innovation, there is often a time inconsistency between the costs and the benefits. The disruptions come first; the benefits take time. When a new technology appears, it's always easier to see the jobs that are likely to disappear, but it's much harder to see the ones that will be created. When automobiles came on the scene, it was easy to see that

saddlemakers' jobs would disappear. But it wasn't obvious that the saddlemaker's skills could be used to make car seats and that higher-productivity auto production would create many more and much higher paying jobs. Ten years ago, if I had said something called TikTok would arrive soon, no one would likely have been able to imagine that, or that social media would create what is now an established occupation—influencer.

The pattern appears to be repeating—only faster. A recent study by Stanford economists found that employment has fallen about 13 percent in occupations most exposed to AI, relative to those less affected.[2] Those contractions have appeared mainly in support and administrative roles—fields that tend to be automated first. This early effect from AI is consistent with what I have been hearing from business contacts. Retailers in particular are cutting back on employment for call centers and IT-related occupations. So far, most say this is being handled through attrition, but a number of retailers say that there is the potential for downsizing next year. That is also a message from a New York Fed survey that finds very few businesses are reporting AI-induced layoffs; they are instead using the technology to retrain employees.[3] That said, AI is influencing recruiting for these firms, with some scaling back hiring because of AI and others adding workers who are proficient in its use. Looking ahead, however, layoffs and reductions in hiring plans due to AI use are expected to increase, especially for workers with a college degree.

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[2] Erik Brynjolfsson, Bharat Chandar, and Ruyu Chen (2025), "Canaries in the Coal Mine? Six Facts about the Recent Employment Effects of Artificial Intelligence," working paper, Stanford Digital Economy Lab, August, https://digitaleconomy.stanford.edu/wp-content/uploads/2025/08/Canaries_BrynjolfssonChandarChen.pdf.

[3] Ben Hyman, Jaison R. Abel, Natalia Emanuel, Nick Montalbano, and Richard Deitz (2025), "Are Businesses Scaling Back Hiring Due to AI?" Federal Reserve Bank of New York, *Liberty Street Economics* (blog), September 4, https://libertystreeteconomics.newyorkfed.org/2025/09/are-businesses-scaling-back-hiring-due-to-ai.

Returning to my final point, history has shown us that technology improves productivity and our standard of living. We initially always talk about how it will be a substitute for labor. This was the basic premise behind Marx's theory of capitalism—machines would replace humans in production, which would raise unemployment so high that social revolution would occur, leading to the end of capitalism and the rise of a socialist utopia. Yet this theory makes the fundamental mistake of failing to see that capital and labor are complements, not substitutes. More machines mean a firm can produce more output, but that also requires more labor as well. This is obvious just looking at economic data. The U.S. capital stock, measured in constant prices, is seven times larger than it was in 1950. Yet the unemployment rate in September 1950 was 4.4 percent, and it is 4.3 percent as of August 2025. This is why economists are typically techno-optimists—history has repeatedly shown that adopting new technologies leads to economic growth and greater employment, not less. Technological disruption is one form of a concept that economists have studied since Joseph Schumpeter named it in 1942: creative destruction. This topic has never been more relevant, and I note that just last week a share of the Nobel Prize in Economics was awarded to two economists who explored how productivity-enhancing disruption raises living standards.[4]

There will surely be losers and winners from AI, but aside from questions about how AI's gains will be distributed, there is the more fundamental matter of how they will be measured, even at a macro level. Firms are using AI to increase productivity, which allows for greater output based on the same level of inputs. This gain is counted in gross domestic product (GDP) and its corollary, gross national income.

[4] The other half of the prize was awarded to Joel Mokyr for work that emphasized the importance of society being open to new ideas and allowing change as an engine of economic development.

In America, one common feature of great technological innovations has been an onslaught of competition that has rapidly driven down costs and resulted in rapid and widespread adoption. If hardware and software innovation continue to drive down the cost of AI, then I see few barriers to its ongoing proliferation throughout the economy. That prospect, clearly, is driving the surge of AI investment we have seen. Will it continue? That will depend, in part, on whether AI delivers on the productivity increases that some believe it will bring.

Labor productivity measures output per hour of work. The data is volatile, but average growth over the past few years is slower than over the past decade or several decades. A crucial question is whether AI will contribute to a resurgence in productivity growth. Any sustained productivity growth above 2 percent will tend to support rising real incomes and living standards without inflation pressure. As a monetary policymaker, I'm hoping that AI delivers.

While we often focus on how technology enhances market activity and productivity, it also enhances the value of non-market-based activities. For example, Google Maps allows me to navigate foreign cities easier and faster when I am sightseeing. While this value is a not market-based activity and does not show up in GDP, it clearly makes my life better. Agentic AI has the potential to save me lots of leisure time that would have otherwise been spent planning vacations, paying bills, or making medical appointments. This increase in my well-being is not directly measured in GDP. But if these time-saving AI activities free me up to do more market-based production, then GDP will increase. I have no doubt that AI will boost GDP and national income, but many of its benefits may be in improving our nonmarket activities.

Every technology that changes how we live and work brings both promise and risk. AI is no exception. Fraud, disinformation, bias, and cybersecurity threats are already emerging. Any tool powerful enough to improve lives can also be misused. The task for policymakers is to manage those risks without slowing the innovation that drives growth. History shows that adaptation, not avoidance, is what sustains progress. Each wave of technology has disrupted industries and employment, but over time it has also lifted productivity, raised real incomes, and improved living standards.

We see different approaches to managing the disruption that occurs with technological change. Europe has often chosen to regulate first—to contain potential harms before the technology fully develops. The United States is taking a different path, leaning on its tradition of experimentation and market dynamism. That openness has long been a competitive advantage. It allowed the United States to lead in earlier waves of technology—from the internet to advanced computing—and it can do the same with AI. Over time, that willingness to experiment has translated into faster productivity growth and stronger economic performance than many of our peers, including Europe.

Thirty years ago, the United States embraced a new and disruptive technology—the World Wide Web. Europe was more cautious, weighed down by regulations and legacy industries that sought to control this innovation. The result, of course, is that America led a global technological revolution that disrupted media and other industries but also delivered jobs and broadly shared prosperity that handily outpaced the European Union over those thirty years. Perhaps the most important legacy of the American-led innovation of networked communications and computing was the culture of entrepreneurship and innovation it fostered, one that, in fact, has greatly contributed to

America's leadership in AI. The American tradition is to invent and make use of technology, not shrink from it. Where there are risks, we take reasonable steps to mitigate them, rather than seek to avoid them altogether. Risk-taking is at the heart of our market economy; it fuels innovation, and we must preserve it.

Much like the leaders in this audience, the Federal Reserve is also learning by doing. I have championed a System-wide approach to continually educate our teams and enable experimentation with the latest wave of innovations—from large language models and agentic AI to applications in coding and payments. That's why, on October 21, I'm convening industry leaders to discuss AI in Payments as part of our Payments Innovation Conference. These engagements, combined with our own hands-on technical research, allow us to apply these technologies within the Fed and to support innovation across the private sector.

To conclude, AI is moving faster than previous waves of innovation. That velocity means both the disruptions and the benefits will arrive sooner. The challenge is to keep pace—to help workers and firms adjust so the gains in efficiency translate into higher real wages and sustained growth across the economy. For policymakers, we must let the disruption occur and trust that the long-run benefits will exceed any short-run costs.

Thank you.