

Six Ways the AI Revolution is Unfolding

Two experts argue that a beneficial, AI-powered economy is possible as long as guardrails are implemented, too.

"The Coming AI Economic Revolution: Can Artificial Intelligence Reverse the Productivity Slowdown?" was recently published in Foreign Affairs by James Manyika and Michael Spence, two authors I've long admired. Manyika is senior VP of research, technology and society at Google, after serving as chairman and director of the McKinsey Global Institute from 2009 to 2022. Spence, a co-recipient of the 2001 Nobel Prize in Economics, is professor in economics and business at NYU's Stern School of Business, and was previously professor of management and dean of the Stanford Graduate School of Business.

"By the beginning of the next decade, the shift to AI could become a leading driver of global prosperity," wrote the authors. "The prospective gains to the world economy derive from the rapid advances in AI - now further expanded by generative AI, or AI that can create new content, and its potential applications in just about every aspect of human and economic activity. If these innovations can be harnessed, AI could reverse the long-term declines in productivity growth that many advanced economies now face."

"This economic revolution will not happen on its own," they added. Unleashing an AI-powered economy will require a new policy framework that fosters AI's most productive uses and enhance human potential and

ingenuity. "These policies must promote technologies that augment human capabilities rather than simply replace them; encourage AI's widest possible implementation, both within and across different sectors, especially in areas that tend to have lower productivity; and ensure that firms and sectors undergo necessary process and organizational changes and innovations to effectively capitalize on AI's potential." Let me summarize the key points in each of the article's six sections.

1. The Great Slowdown: "The accelerating progress of AI comes at a pivotal moment in the global economy." Over the past three decades, technology advances and productivity growth have been moving in starkly different directions. The total number of patents granted between 1990 and 2010 grew from 99,000 to 208,000, with ICT and electronics patents accounting for 80% of the increase. And, while total factor productivity (TFP) - generally considered the primary contributor to GDP growth - grew by 1.7% in the U.S. between 1997 and 2005, its growth has been minimal, just around 0.4% since 2005. At just 0.16%, productivity growth has been particularly anemic in the service sector of the economy which now comprises almost 80% of U.S. employment.

In addition, aging populations in countries that account for over 75% of global economic output are limiting the growth of the labor force. The labor force is already shrinking in some countries, like China, Ja-

pan, South Korea, and Italy, and the list of countries with a shrinking labor force is expected to increase in the years to come.

"In short, without a powerful new productivity-enhancing force, the global economy will continue to be held back by slow growth and reduced labor supply, the persistent threat of inflation, higher interest rates, shrinking public investments, and elevated costs of capital for the foreseeable future."

2. A Different Digital Revolution: "The AI revolution has shattered the constraints of earlier digital technologies."

The internet revolution of the 1990s ushered the transition from the industrial economy of the previous two centuries to a new kind of 21st century digital economy. While extensive, automation in the digital revolution was limited to those activities that could well be described by a set of rules and could thus be explicitly programmed in software.

The AI revolution has now extended the impact of technology innovations beyond rules-based tasks and software programs.

AI can now be applied to the many tasks that we don't know how to program because they defy codification. Given enough data and computing power, our digital machines can now be applied to tasks that involve pattern recognition, such as recognizing a picture of a cat. Over the past decade, AI advances have achieved or surpassed human levels of performance in an increasing number of tasks, including image and speech recognition, skin cancer classification, breast cancer detection, and winning at championship level Go.

3. Quick Studies: "Generative AI has several features that suggest its potential economic impact could be

unusually large." These include:

- Versatility. Large language models (LLMs) can respond to prompts in many different domains, "from poetry to science to law, and to detect different domains and shift from one to another, without needing explicit instructions."
- Multimodality. Beyond words, LLMs can work with different kinds of inputs, including audio, images, video, and software. "Their ability to operate flexibly among multiple disciplines and modes means that these models can provide a broad platform on which to build applications for almost any specific use."
- Accessibility. LLMs have far more potential uses than previous digital technologies. They can be readily used by people who lack technical skills because they respond to ordinary language and other common kinds of inputs. "All that is needed is a little practice in creating prompts that elicit effective responses." In addition, they're able to acquire expertise in almost any field of knowledge.

The article mentions two prominent areas for future uses of LLMs: digital assistants, for tasks like producing the first draft of a document or software program; and ambient intelligence systems that respond to physical inputs such as sensor-based home automation systems, and voice recognition systems that can generate a draft of a patient's health record by recording and summarizing the conversation between patient and clinicians.

4. Creative instruction: "Despite the promise of AI, much of the public debate about it has focused on its controversial aspects and its potential to do harm." Much has been written about the fact that LLMs can be unreliable, reflecting racial and gender bias in their training data sets, producing erroneous mate-

rial, and so-called hallucinations that sound plausible but don't reflect reality. "Researchers are trying hard to address these issues, including by using human feedback and other means to guide the generated outputs, but more work is needed."

Another major concern is that AI could achieve wholesale automation of many sectors, triggering large-scale job losses. The article noted that roughly 10% of all occupation will likely decline while other new and existing occupations will grow. "But the largest effect of AI on the economy overall, involving about two-thirds of occupations, will be to change the way that work is performed, as some constituent tasks – on average about a third – are augmented by AI. Occupations in these fields will not go away, but they will require new skills as people do their jobs in collaboration with capable machines."

Similarly, a two-year (2018-2020) MIT task force on the Work of the Future concluded that "No compelling historical or contemporary evidence suggests that technological advances are driving us toward a jobless future. On the contrary, we anticipate that in the next two decades, industrialized countries will have more job openings than workers to fill them, and that robotics and automation will play an increasingly crucial role in closing these gaps. Nevertheless, the impact of robotics and automation on workers will not be benign. These technologies, in concert with economic incentives, policy choices, and institutional forces, will alter the set of jobs available and the skills they demand."

5. With Us, Not Against Us: "Despite its enormous promise, AI is unlikely to trigger an economy-wide jump in productivity, or to support sustainable and in-

clusive growth, if its use is left to market forces."

"Achieving AI's greatest potential benefits will require a proactive two-sided approach. First, is anticipating and to the extent possible, preventing the misuse or harmful effects of the technology. The other is promoting the uses of AI that most assist and benefit people, power the economy, and help society tackle its most pressing opportunities and challenges – by making it more accessible, ensuring its widespread diffusion, and encouraging its most productivity-enhancing applications."

6. The Real AI Challenge: "AI, including its most recent addition, generative AI, has the potential to produce a large and decisive upswing in productivity and growth at a moment when the global economy desperately needs it."

"The development of AI has reached a crucial juncture," Manyika and Spence conclude. "The technology's fraught potential, to bring enormous human and economic gains but also to cause very real harms, is coming sharply into focus."

But harnessing the power of AI for good will require more than simply focusing on existential threats and potential damage. It will demand a positive vision of what AI can do and effective measures to turn that vision into reality. The most likely risk that AI poses to the world today is not that it will produce some kind of civilizational catastrophe or a huge negative shock to employment. Rather, it is that

without effective guidance, AI innovations could be developed and implemented in ways that simply magnify current economic disparities rather than bring about a strengthened global economy for generations to come.