AI'S PROMISE FOR THE GLOBAL ECONOMY

Michael Spence

If properly used, it could significantly accelerate economic growth and help productivity growth rebound

The postpandemic global economy is beset by slower growth, the most persistent inflation in decades, limited progress on sustainability, and high borrowing costs weighing on investment, including the massive investments needed for the energy transition. Perhaps the strongest headwind, though, is sluggish productivity growth since the global financial crisis.

AI is our best chance at relaxing the supply-side constraints that have contributed to slowing growth, new inflationary pressures, rising costs of capital, fiscal distress and declining fiscal space, and challenges in meeting sustainability goals. And the reason is that AI has the potential not only to reverse the downward productivity trend, but over time to produce a major sustained surge in productivity.

Of course it will take time. Roy Amara's law applies here as in past episodes of technological transformation: we tend to overestimate the short-run impacts and underestimate the longer-term ones. My best guess (and it is just a guess, based on current patterns of investment) is that we may start to see meaningful impacts in labor productivity by the end of this decade.

All these things result from the collision of three powerful forces.

The first is shocks, including war, pandemic, climate change, geopolitical tensions, resurgent nationalism, and growing focus on national

security in the conduct of international economic policy. These increasingly severe and frequent disruptions are shifting global supply networks toward greater diversification and resilience. But that is an expensive pressure and a contributor to inflationary pressures.

For example, Apple is steering more manufacturing to India, which now produces 15 percent of iPhones. Meanwhile, only South Korea and Taiwan Province of China make (as opposed to design) the most advanced semiconductors, an unsustainable arrangement from a national security perspective.

Diversification of sourcing is reinforced by policy initiatives aimed at bringing important supply chains back home, or at least to friendly countries, while denying adversaries access to goods, technology, and capital. Some of these protectionist policies are to protect domestic workers from foreign competition.

The result is a rapid postpandemic fragmentation of global supply networks that were more cohesive in the postwar years. Supply chains then largely followed economic criteria: efficiency and comparative advantage. Now, it's impossible to maximize resilience and minimize costs at the same time, and we are no longer minimizing costs. Among many factors, this structural shift has contributed to inflationary pressures.

Secular trends

Even as pandemic supply-chain strains eased, a second set of colliding forces is embodied in secular trends that further reduce the economy's supply elasticity and raise costs. These include declining productivity, especially in advanced economies.

These trends also include aging populations in economies that account for more than 75 percent of global output. Declining fertility rates and increasing longevity are slowing the growth of—or even shrinking—the labor force, leaving fewer workers caring for more seniors. Depending on social security systems, this creates fiscal stress at a time when central bank interest rates remain elevated. It's striking that many advanced economies have labor shortages in high-employment sectors. Amid robust aggregate demand, this has impeded growth and added to inflationary pressures, especially in the US. Germany has experienced similar labor supply issues.

The pandemic impact included an increase in sovereign debt levels in a wide range of economies. Global sovereign debt now exceeds global gross domestic product and continues to rise beyond this threshold in the United States, where the ratio is now 120 percent. Europe's ratio is 88.6 percent, with Greece, Italy, Spain, France, Belgium, and Portugal above the average (in the cases of Greece and Italy, by a lot). China's sovereign debt looks lower, except when you count the debt of state-owned enterprises, which form a significant part of the corporate sector. This is partially explained by massive and successful pandemic spending to prevent human suffering, business closures, and damage to personal and corporate balance sheets. One reason demand remained resilient as interest rates rose is exactly because the balance sheet damage that occurred during the global financial crisis was much less in the pandemic economy.

Driverless delivery vehicles drive on a street in Ordos, Inner Mongolia, China, in June 2024.

Finally, in this second category, the powerful multidecade deflationary force associated with emerging market economy growth and the introduction of large increments of productive capacity into the global economy, especially but not exclusively in China, is fading.

Development economists refer to this as the "Lewis turning point." That's the stage of growth at which the underemployed and underused labor in an emerging market economy's traditional sectors

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is largely used up and absorbed by urbanization and better-connected parts of the economy.

Productivity deserves special attention. US productivity growth averaged 1.68 percent from 1998 to 2007, a period during which many Americans got internet access and, later, mobile phones. Productivity growth then slowed to 0.38 percent from 2010 to 2019.

This decline was economy-wide. Productivity growth for the tradable goods and services sectors, which tend to be more productive despite employing less than a quarter of workers, fell from 4.27 percent to 1.23 percent. The large and less productive nontradable services sectors declined from 0.73 percent to effectively zero.

A startling fact is that despite this recent pattern of subdued productivity growth, the US has been a star performer relative to other advanced economies, including all of Europe. In Europe, lagging growth and productivity are attributable in part to less rapid and effective adoption and deployment of digital technologies, and to underdeveloped tech sectors relative to the US and China.

Measured productivity edged up during the pandemic, largely because less productive industries were partially shuttered, while higher-productivity sectors shifted to remote work. We will need more data to know whether this pickup will endure, but similar patterns are visible in other developed economies.

The combined effect of these two sets of forces is a relatively rapid shift from demand-constrained to supply-constrained growth. Growth is subdued. Inflation endures. Real interest rates remain elevated. Many economists, including me, believe that the structural conditions I've described mean borrowing costs are likely to remain elevated, and certainly higher than during the decade following the global financial crisis. That will likely cause important changes in the investment world, including by keeping the cost of capital and discount rates higher and depressing valuations.

It is worth noting that investors disagree and change their minds on the likely path of interest rates. For example, expectations last year for the Federal Reserve to make seven quarter-point

interest rate cuts this year were quickly dashed. Markets are now discounting one to two cuts. Expectations may evolve further toward higher-for-longer rates, and structural conditions point that way.

Technological revolutions

This brings us to the third set of colliding forces: science and technology. There are at least three revolutionary transformations underway. One is the multidecade digital transformation, now accelerated by breakthroughs in AI. The second is a revolution in biomedical and life sciences. The third is the technologies that underpin the transition to sustainable energy.

All three enjoy ample investment. Accelerating progress is driven not only by breakthroughs, but also by the availability of a host of powerful tools that are experiencing declining costs and increased accessibility. Solar costs have plunged in the past decade. Other advances have proliferated, from advanced semiconductors to DNA sequencing to three-dimensional models of hundreds of millions of proteins available for free in a public database.

Developing technologies like these and deploying them for productive uses will spur major structural changes for the world's economies. We can't predict the full scope of what these changes portend, but the effects are sure to be significant.

Emerging technology can produce a sustained surge in productivity, as I argued last year in an article on the potential of generative AI (with James Manyika of Google). This is consistent with other estimates, like that of the McKinsey Global Institute.

Generative AI is the first AI with a humanlike capacity to operate in multiple domains and to detect and switch domains based only on conversational prompts. It can talk about inflation, write computer code, do some mathematics—though this is a work in progress. Superhuman pattern recognition ability makes it a powerful digital assistant. Rather than full automation, the better model is machine-human collaboration, or what is sometimes called "augmentation."

Geoffrey Hinton, a pioneer of modern neural network AI, has a special understanding of the implications. He uses the example of an experienced doctor. While she/he may have treated thousands of patients, medical AI can review and absorb hundreds of thousands. That can make it helpful to the experienced doctor, and even more so for those who are less seasoned. This is consistent with studies of AI applications in other areas, like customer service, where AI digital assistants, trained on past interactions, produced large productivity gains overall and even greater benefits for less experienced agents.

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AI is general-purpose technology that has applications across the entire economy, by sector and type of work. This is important, because only general-purpose technologies can produce an economy-wide productivity surge.

AI applications are already being built into personal devices such as phones, thanks in part to advanced semiconductors.

That said, challenges need to be overcome to achieve the potential. One is implementing regulation to prevent misuse of the technology and data. That risk-mitigation regulatory agenda is in process across the globe.

Another is overcoming automation bias, or what Erik Brynjolfsson calls the Turing Trap, the strong tendency to view this technology as full automation and thus a replacement for humans.

This is a common view in the media, business, and policy discussions. The widespread concern about dramatic declines in employment reflects this.

Probably the most important policy issue concerns potential gains. For AI to achieve full economic impact over time, it must be accessible to all sectors of the economy, and to companies large and small. There is little doubt that the massive investments undertaken in industries like technology and finance will have a major impact, but the applications need to get to large employment sectors that tend to lag—like government, health care, construction, and hospitality. Pre-AI studies of digital adoption indicate that this broad diffusion pattern is not guaranteed, that left entirely to market forces divergence is possible or even likely.

Policies for accessibility, diffusion, and skills to help realize the full potential of AI are currently weak in comparison with the intense focus on risk mitigation and misuse. Expanding the former without abandoning the latter is an important element of policy rebalancing. This is not to advocate government's picking winners or national champions. On the contrary, effective competition policy should be part of the policy portfolio. In addition, part of the focus needs to be on sectors and businesses that may lag in discovery and adoption, small and medium enterprises for instance. And since jobs will change with AI collaborators, retraining and new skills acquisition deserve priority attention.

Challenges to overcome

The potential gains from AI go well beyond countering postpandemic productivity and growth challenges. They are set to impact science and technology research, from biology to physics and materials science, and to play a key role in the energy transition.

Talent, computing power, and rapidly expanding electricity demand are the main barriers to building increasingly powerful generative AI models. Availability of data is not a major constraint. The internet has ample training data. Of course, there is AI that is not in the generative AI category that is powerful and important. AlphaFold, an AI system that predicts three-dimensional structures of proteins, is an example. For this application you need specialized biology data and expert input on how protein folding works.

It is also true that the mega-platforms that are driving the development of generative AI have business models that rely on personal data and very precise targeting. But to train large language models and the like, you do not need personalized and sensitive data.

The systems powerful enough to train models with billions of parameters reside largely in cloud computing systems in the private sector, mostly in the US and China. That, plus the competition for talent, puts science and academia at a disadvantage. Expanding computing infrastructure to a broad community of researchers and innovators is an important policy step needed to democratize building an open community with a good balance between academic and private innovation. Achieving that balance will support widespread diffusion.

Europe risks falling behind the United States and China in developing and applying AI for three reasons. One is the European Union's relative underfunding of basic research. The second is that it lags in computing power to support research. The third is a failure to fully leverage the large scale of the European economy. With high fixed development costs and relatively low variable costs in digital and AI, scale is a huge advantage in determining return on investment. European capital markets remain fragmented; service market integration is incomplete and hampered by fragmented regulation at the national level. Whether this situation persists or there is a change of direction after the recent European Parliament elections remains to be seen. Two reports to the European Commission—one from Enrico Letta and a forthcoming one from Mario Draghi—advocate elevated investment in digital technology.

China is an AI powerhouse. India, with its strong roots in digital technology, a large and growing internal market, and deep reservoirs of engineering human capital, is likely to be a growing force.

The rest of the emerging market economies may benefit greatly from AI applications, but for the next few years at least, they will be largely consumers of advanced AI technology generated mostly in the US and China.

AI will drive large-scale structural change and disruption for decades. While some will lose jobs via automation or rapid productivity growth, and others will be hired for jobs that are new and created by the technology, it's the workers in the middle who will be most impacted. Here jobs will not necessarily vanish, but they will change. It will be a disruptive process requiring different skills and a lot of organizational change. Both the private and public sectors have important roles in smoothing the transitions.

With policy support to accelerate diffusion across the entire economy, AI could significantly accelerate economic growth and help productivity growth rebound. And if it relaxes the supply-side constraints that are part of the inflation story, indirectly it could lower real interest rates and the cost of capital over time. In a world that requires trillions of dollars of investment to change the equation for energy efficiency and the green transition, that would help. And in the aging part of the global economy, it would help the younger working population support the older group without undue sacrifice.

Despite the shocks and secular headwinds to growth, we do have the talent and tools to foster growth, inclusion, and sustainability in the global economy—but only if we have the will to use them aggressively but wisely. F&D

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