



By: Michael Spence

Will AI-transition bring broad-based prosperity?



There is little consensus around anything AI-related these days. But one expectation that does seem to have taken hold among a large share of businesses, investors, and analysts is that the technology will enhance productivity in a wide range of areas. But even if these gains materialize, will they be worth it?

Many observers – including me – anticipate significant AI-enabled productivity gains. For starters, initial evidence from a growing collection of use-case studies indicates as much.

Moreover, given the rapid expansion of AI functionality, the declining costs of training and using AI models, and the embrace of open-source tools and systems, it seems likely that AI can be applied in meaningful ways in virtually every sector and job category.

Of course, effective implementation of AI is not a foregone conclusion, nor will it happen overnight, owing to issues of access, diffusion, and learning curves.

But even if these barriers are overcome, it is far from guaranteed that AI-enabled productivity gains would deliver broad-based benefits, in terms of employment and incomes. That depends on what happens in two areas: the AI toolkit and the job market.

The AI toolkit

We know that the AI toolkit is expanding fast. But if most of the additions focus on replicating human capabilities – and thus replacing human workers – the productivity improvements will be accompanied by negative distributional effects.

And yet, as Andreas Haupt and Erik Brynjolfsson recently **pointed** out, a significant subset of current benchmarks for machine-learning systems are biased toward automation, with few including humans in evaluations.

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To prevent AI development from becoming an “imitation game,” Haupt and Brynjolfsson advise the developer community to embrace “centaur evaluations,” in which humans and AI systems jointly solve tasks.

This would shift machine-learning development toward augmentation or machine-human collaboration, rather than automation.

Job market

But, to ensure that the benefits of AI are broadly shared, we must also look at the job market.

Consider the United States. About 20% of the country’s workers are employed in the tradable sector, which includes manufacturing (40%) and services (60%) that trade internationally.

The remaining workers – almost 80% – **work** in non-tradable service sectors, such as government, education, hospitality, traditional retail, and construction.

The divergence between tradable and non-tradable sectors, in terms of productivity and income, has grown steadily over the last three decades.

Generally, the tradable sectors – which include jobs like managing multinational enterprises, designing semiconductors and computers, and carrying out research and development – boast higher and faster-growing productivity, and higher income growth.

That is why, even as manufacturing employment declined and then leveled off, output – or, more precisely, value added –

continued to grow.

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If we are not careful, AI will widen the gap between tradable and non-tradable sectors, leading to a sharp increase in inequality.

Only if AI is applied effectively not only across the tradable and non-tradable sectors, but also to lower- and middle-income jobs within these sectors, can it lead to economy-wide productivity gains and a broad-based increase in incomes.

That is why a concerted effort must be made to tilt AI development toward augmentation and collaboration across the job and income spectrum.

Transition is never frictionless

There are some positive signals on this front. The US Defense Advanced Research Projects Agency has **conducted** competitions focused on human-robot cooperation, such as robots enhancing humans' physical capabilities and humans controlling robots as they navigate complex, rapidly evolving physical environments.

But more must be done. Funding for basic research in AI, including by governments, should emphasize augmentation and collaboration, and incentives for private developers should be introduced.

Other considerations can and should also shape AI development. DeepMind's AlphaFold delivers significant efficiency and productivity gains by carrying out a highly labor-intensive and time-consuming task: predicting the structure of proteins based on their amino-acid sequence.

But its purpose is not to replace humans so much as to advance an area of biomedical

science. This benefits humans in other ways.



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Nonetheless, ensuring that the AI toolkit offers augmentation- or collaboration-based benefits across sectors and income levels must be a top priority.

But that alone cannot guarantee a significant boost in broad-based prosperity, because there are still general equilibrium effects at work.

We saw this in a previous round of digital adoption, when many routine, codifiable jobs were automated.

Add to that globalization – which entailed the outsourcing of labor-intensive manufacturing jobs – and a huge number of displaced, often-middle-class workers had little choice but to shift to non-routine jobs, often at lower productivity and income levels. Such a transition is never frictionless.

In the coming AI transition, productivity gains will lead to lower costs and, together with normal competitive pressures, to lower prices. But if the elasticity of demand in a sector is less than one, jobs will be lost.

Of course, other sectors, with higher demand elasticities, will add jobs. But the movement of people across sectors and job categories implies considerable turbulence.

And there is a real risk of a transitory increase in labor supply relative to demand, which

would weaken labor's bargaining power.

As many have pointed out, transition support, in terms of both income and skills, is essential, and AI-powered tools likely will be able to help in retraining and skills acquisition. At the same time, policymakers should create labor demand, as was done in the aftermath of the Great Depression.

For the US, this offers an opportunity to kill two birds with one stone. For a number of **reasons**, the US economy has fallen behind on infrastructure development and upgrading. Reversing this trend would add good jobs and labor demand, thereby creating a buffer for the coming AI-driven transition.

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