

What we're reading about the age of AI, jobs, and inequality

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AI has prompted concerns about job displacement and income insecurity. Copyright: Arne Hoel/World Bank

Anxieties about job displacement and income insecurity in the age of artificial intelligence (AI) are widespread. History provides reassurance that such concerns are not novel. From the Industrial Revolution to the current age of AI, each wave of technological advancement has reshaped the workplace, prompting concerns about job displacement with machines replacing human labor.

At the Bletchley Park AI summit in 2023, Elon Musk famously forecast a future where AI will render all jobs obsolete, leading to a paradigm of abundance without scarcity of goods and services. Such prophecies echo sentiments from as early as 1930s when John Maynard Keynes spoke of "technological unemployment," a phenomenon where the pace of technological innovation outstrips the creation of new jobs.

Debate on technological unemployment

The debate on technological unemployment among economists has been long-standing and intense.:

- Robert Solow and Karl T. Compton have argued that while technological progress drives economic growth and prosperity, it can also lead to disruptions in employment.
- Solow emphasized that income distribution is ultimately a hard societal choice, not solely determined by technological change.
- Erik Brynjolfsson and Andrew McAfee paint a sobering picture of the great decoupling between wages and productivity, signaling a potential crisis in income inequality. They argue that professions of all kinds – from lawyers to truck drivers – will be upended, with economic indicators reflecting fewer people working, and incomes stagnating or even falling despite increasing productivity and profits.
- Carl Frey and Michael Osborne's seminal paper predicts significant job automation in the coming decades, particularly affecting routine tasks, pointing to the hollowing out of the labor market and income polarization in some countries.
- Daron Acemoglu and Simon Johnson caution against assuming AI will generate more jobs than it displaces, calling for policy choices to foster job creation.
- David Autor contends that expert commentators and journalists tend to overstate the extent of job substitution and ignore the strong complementarities between automation and human labor that increase productivity, raise earnings, and augment demand for labor. It should be noted that much of the literature is focused on developed countries with fewer from developing countries.

Will AI-driven transformation be similar or different from earlier economic transformations?

AI has been around for decades, although the hype has peaked and waned. Backed by the exponential global diffusion of mobile devices and the internet – yet persistent and gendered digital divide -- one conjecture is that the impacts might be more dramatic than expected in developing contexts such as in Africa, Asia, and for rural and remote communities. Emerging markets and low-income countries are less well prepared to leverage AI, which could exacerbate the digital divide and cross-country income disparities.

Cross-country studies of labor market exposure to AI reveal that advanced countries face a higher risk due to the prevalence of cognitive-task-oriented jobs; but they are also better positioned to exploit the benefits of AI compared to emerging market and developing economies. Women and highly educated workers also face greater exposure, with high potential complementarity.

The 2016 World Development Report showed for the first time that the labor market is hollowing out in developing countries as well, with low skilled jobs facing increasing competition and declining wages, disproportionately held by the least educated and the bottom 40 percent of the income distribution. The biggest risks may not be massive unemployment but widening inequality, risks of exclusion, and harms. Fei Fei Li, professor of Computer Science and Director of the Stanford Institute for Human-Centered

AI, advocates for keeping humanity at the forefront of this technological revolution. Timnit Gebru, a former student of Li's, emphasizes the need for institutional and structural changes to ensure Ethical AI.

AI's trajectory is not predetermined, and it can develop in very different directions

The future that emerges will be a consequence of policy choices made today. Carefully calibrated policies should not only foster skill development but also facilitate the adaptive capacity of the workforce to navigate this evolving landscape. Investment in education and alternative skill development formats becomes paramount to use human capital to its full potential. A critical reexamination of the social contract and the hard social choices of income distribution will likely come into play. Social protection systems will need to adapt to support the vulnerable, including job displacement, ensuring economic inclusion in the digital economy and age of AI.

History has afforded rich lessons for humanity in building resilience in the face of technological change. By embracing ethical considerations, proactive policy interventions, and investing in human capital, we can navigate the age of AI while reducing poverty and inequality, fostering inclusion, and boosting shared prosperity for all.

Featured studies on economic policy considerations in the age of AI:

- AI's trajectory is not predetermined and could be influenced by proactive policy choices. The paper considers the implications of AI on three broad areas of macroeconomic interest with forks in the road for each: productivity growth, income inequality, and industrial concentration. (Brynjolfsson & Unger, International Monetary Fund, December 2023)
- Redirecting AI development towards human-complementary technologies could foster job creation and inclusive economic growth. Policy reforms need to ensure that AI benefits all segments of society and contributes to shared prosperity (Acemoglu & Johnson, International Monetary Fund, December 2023)
- AI presents an opportunity to revitalize the middle class by enabling a broader set of workers with complementary knowledge to engage in higher-stakes decision-making tasks carried out by elite professionals such as doctors, lawyers, engineers, and professors. (Autor, NBER Working Paper, February 2024)
- Employers for emerging professions in AI or green jobs have started "skill-based hiring" where university education does not show a premium for AI roles. (Ehlinger & Stephany, CESifo, December 2023)
- Assessing job vulnerability to computerization, this seminal study predicts 47 percent of US employment could be automatable within the next two decades. (Frey & Osborne, Technological Forecasting and Social Change, January 2017)
- Examining the intricate relationship between automation and labor, this paper contends that widespread job loss has not occurred despite concerns. Automation replaces some tasks, but it also complements human labor, increasing productivity and demand for labor elsewhere. (Autor, Journal of Economic Perspectives, Summer 2015)

- Polanyi's paradox and the history of computerization provides the backdrop for an exploration of labor market polarization and the challenges of substituting machines for human labor in tasks requiring adaptability and creativity. (Autor, NBER Working Paper, September 2014)
- This paper proposes a new methodology to assess AI impacts across countries, noting a gap in research focus between advanced and developing economies. (Carbonero et al., Journal of Evolutionary Economics, February 2023)
- A nuanced exploration of AI's potential impact on labor markets. AI poses risks of labor displacement through task automation but also holds promise in its ability to boost productivity and complement human labor. Women and highly educated workers face greater exposure with also high potential complementarity. (Pizzinelli et al., IMF Working Paper, October 2023)
- Based on extensive panel data from China, the paper shows AI has a negative effect on employment of low skilled labor force and a positive effect on medium and high skilled labor force. It calls for investments in education and improvements in quality of low skilled labor force. (Ma et al., Economic Analysis and Policy, December 2023)
- Almost 40 percent of global employment is exposed to AI, with advanced economies at greater risk but also better poised to exploit benefits. Emerging markets and low-income countries are less well prepared to leverage AI, which could exacerbate the digital divide and cross-country income disparities. (Cazzaniga et al., IMF Discussion Note, January 2024)
- Investing in human capital in Africa can help mitigate challenges arising from automation and globalization. The piece raises concerns about the concentration of low-skill jobs that are vulnerable to automation and insufficient quality jobs to accommodate growing working age population. (Kenny, blog post, October 2019)

Other essential readings on AI and inequality

- Algorithmic exclusion is a source of persistent inequality. It highlights the importance of understanding how background characteristics influence data availability and accuracy and calls for greater accessibility of information for individuals to correct inaccuracies in order to promote fairness in business decisions. (Tucker, Brookings Working Paper, February 2023)
- A thought-provoking paper by an interdisciplinary team questions whether the pursuit of ever larger language models is necessary, considering associated costs and risks, including environmental and financial, diversion of resources and potential for significant harms due to misinterpretation. (Bender et al., FAccT '21: Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency, March 2021)
- While some proponents of universal basic income may see it as a way to buy off those made unproductive by the new economy, evidence suggests that people want to work, not just because they need the money; work brings with it a sense of purpose, belonging, and dignity. (Banerjee & Duflo, *Good Economics for Hard Times*, November 2019)

Featured book

This book tells a riveting personal story of a young immigrant and scientist at work connected to the origin stories of AI, an explanation of what AI actually is – and how it came to be. (Li, *The Worlds I See: Curiosity, Exploration, and Discovery at the Dawn of AI*, November 2023)

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