Conclusion 6

Urgency for policy action

As artificial intelligence (AI) becomes part of the fabric of everyday lives across the world, millions cannot be left on the sidelines to watch as innovation transforms society. Some argue that AI has limited relevance for lower-income countries (LICs) and middle-income countries (MICs), raising doubts about whether these nations should prioritize AI. Governments in LICs and MICs, facing more urgent needs such as health care and infrastructure, may question the wisdom of investing in a technology with current dubious benefits.

However, such views may be short-sighted. People tend to overestimate the short-term impacts of new technologies and underestimate the long-term impacts. AI's current limitations should not overshadow its potential and the inevitability of its continued improvement. Thus, proactive, strategic actions from governments are required to prepare for potential disruptions.

As AI adoption accelerates in advanced countries, delayed action in LICs and MICs could leave them further behind. Advanced countries lead AI innovation and are poised to adopt AI faster and more broadly, reaping more productivity gains. The gaps in productivity and living standards between frontier economies and LICs may grow further. The long-term consequence could be a stark bifurcation of the global economy, with AI-empowered advanced economies pulling further ahead and developing countries struggling to maintain economic and social progress.

Unlike within-country redistribution, where national governments have mechanisms to mitigate inequality, no well-established global institutions exist for large-scale redistribution across countries. Therefore, the potential for AI to exacerbate global inequality is much greater, and the policy challenges are far more complex (Korinek 2024).

Delayed AI adoption may also mean dwindling export-led growth opportunities and shrinking space to create good jobs. AI will reshape countries' comparative advantages and global production specialization. For developing countries, the race is not only with advanced economies but also with each other. The speed, scale, and depth of their AI adoption can affect how much they benefit. Export-led growth, which has been pivotal to many developing countries, is under threat. Just as automation precipitated premature deindustrialization, generative AI (GenAI) may lead to premature deprofessionalization, capping the share of good white-collar jobs at lower levels before countries reach higher income levels (Liu 2024).

With AI-powered machines further threatening manufacturing jobs and GenAI disrupting digitally deliverable services, export opportunities for developing countries could shrink. In such cases, most jobs left in developing countries will be in either farming or low-skilled services, which is insufficient to sustain broad-based economic development.

Although AI is diffusing rapidly in developing countries compared with earlier technologies, its intensity of usage and overall effectiveness remain significantly lower than in advanced economies. The relative ease of AI adoption stems from its ability to piggyback on existing digital devices and services; the availability of low-cost, open-source tools; and the flexibility to easily switch between providers. Unlike earlier general-purpose technologies, AI and digital services benefit from network effects that enable rapid scaling across populations. Yet, the lack of high-quality energy and digital infrastructure, along with the unaffordability of digital devices and services, continues to hinder widespread internet access in some developing regions. Consequently, although consumers and firms in these countries may be using AI, they represent only a small fraction of the overall population or businesses.

Furthermore, the frequency and depth of AI usage in developing countries remain limited compared with advanced countries, because effective AI use often depends on sufficient digital skills and localized adaptations—resources that are still scarce in many developing economies. This limited intensity and effectiveness of AI adoption restricts developing countries from deriving the full benefits of the technology.

More important, developing countries that are more digitally mature cannot afford to be only passive consumers of AI; they need to strive to customize AI models to adapt to local demand and even become AI producers and innovators if they are to capture more benefits. In digital and AI technologies, increasing returns to scale and scope, network effects, and "winner-takes-most" dynamics mean that those who produce and own the technology capture most of the gains. The least-AI-ready countries may start by adopting off-the-shelf AI solutions such as ChatGPT for individual and small firm usage. Developing countries with some AI capabilities can realize greater value from AI by customizing and adapting these technologies to their local contexts. More sophisticated countries can foster their own AI start-ups and build a foundation for AI innovation in key niches and applications to tap into the full potential of AI. This work will create opportunities not just to consume but also to contribute to and shape the global AI development landscape.

Eventually, governments must balance the risk of inaction or delayed action against the risk of premature, misallocated investment. Regardless of whether AI fully lives up to the hype, its value in specific applications is substantial, and its economic significance will continue to grow as innovation continues and adoption accelerates. This creates a strategic imperative for early action: Innovators and early adopters stand to gain significant advantages from knowledge spillovers, economies of scale and scope, and first-mover advantages, whereas late movers risk falling behind. However, premature or misdirected investments could yield suboptimal returns and divert resources from other critical areas.

Investing in the 4*Cs*

Investing in the 4Cs—connectivity, compute, context (training data, models, and applications), and competency (digital skills)—represents a strategic, largely no-regret approach for LICs and MICs although specific priorities must be tailored to each nation's unique circumstances (refer to table 6.1). A key factor contributing to AI's limited impact thus far is significant implementation lag, a challenge that is acute in developing economies. Even if AI's transformative potential proves less dramatic than some anticipate, strengthening the 4Cs is essential for the broader digital transformation efforts already under way. These foundational elements—robust computing

TABLE 6.1 Prioritize AI investments on the basis of AI readiness

AI capability and 4Cs	Country AI readiness level		
	Low	Medium	High
AI capability	Adopt	Adopt and adapt	Adopt, adapt, and innovate
Connectivity	• Provide universal access to electricity • Improve broadband coverage, quality, and affordability • Support device ownership and access	• Upgrade broadband infrastructure • Provide internet exchange points • Promote digital goods and services exports	• Upgrade broadband infrastructure • Support and develop the local digital sector and digital ecosystem
Compute	• Rely mostly on cloud computing and foreign data centers	• Invest in domestic data centers • Provide data embassy and regional data centers for small countries • Partner strategically with foreign cloud and AI chip providers	• Develop and purchase cutting-edge AI chips • Build high-performance computing systems • Build AI data centers
Context	• Rely largely on translation and existing AI models • Collaborate and partner with global companies and initiatives to collect local data • Improve government statistical and data collection capacity	• Combine translation of and investments in local data sets in select domains; develop synthetic data • Customize open-source AI models • Develop local AI applications in niche markets	• Invest in local training data across major domains • Customize open-source AI models; create cutting-edge domestic models • Enhance data governance
Competency	• Improve digital literacy, as well as basic and intermediate digital skills	• Focus on intermediate and advanced digital skills • Attract and retain talent	• Develop advanced digital and AI skills • Develop and support top-notch AI researchers • Attract and retain talent

Source: Original table for this publication.
Note: AI = artificial intelligence.

infrastructure, high-quality training data, and a digitally skilled workforce—are prerequisites for participating in the modern digital economy, regardless of the precise trajectory of AI development. Building a strong foundation in the 4Cs will not only position LICs and MICs to capitalize on the opportunities presented by AI but also will enhance their ability to leverage other digital technologies for economic growth and social progress.

In the digital and AI age, a country's size—particularly in the form of a vast, integrated domestic market—confers a significant advantage. Digital technologies, including AI, exhibit powerful economies of scale and scope. Once built, platforms and models can be deployed at near-zero marginal cost while value grows rapidly along with user numbers because of network effects. This creates winner-takes-most dynamics, where the largest markets breed the most-competitive firms,

which in turn attract more users, data, talent, and investment. A large domestic user base enables firms to scale rapidly, iterate products faster, and gather the vast and diverse data sets essential for training AI models. Unlike in fragmented or smaller markets, companies in large, unified economies can test and refine AI applications across millions of users and sectors without facing regulatory or linguistic barriers.

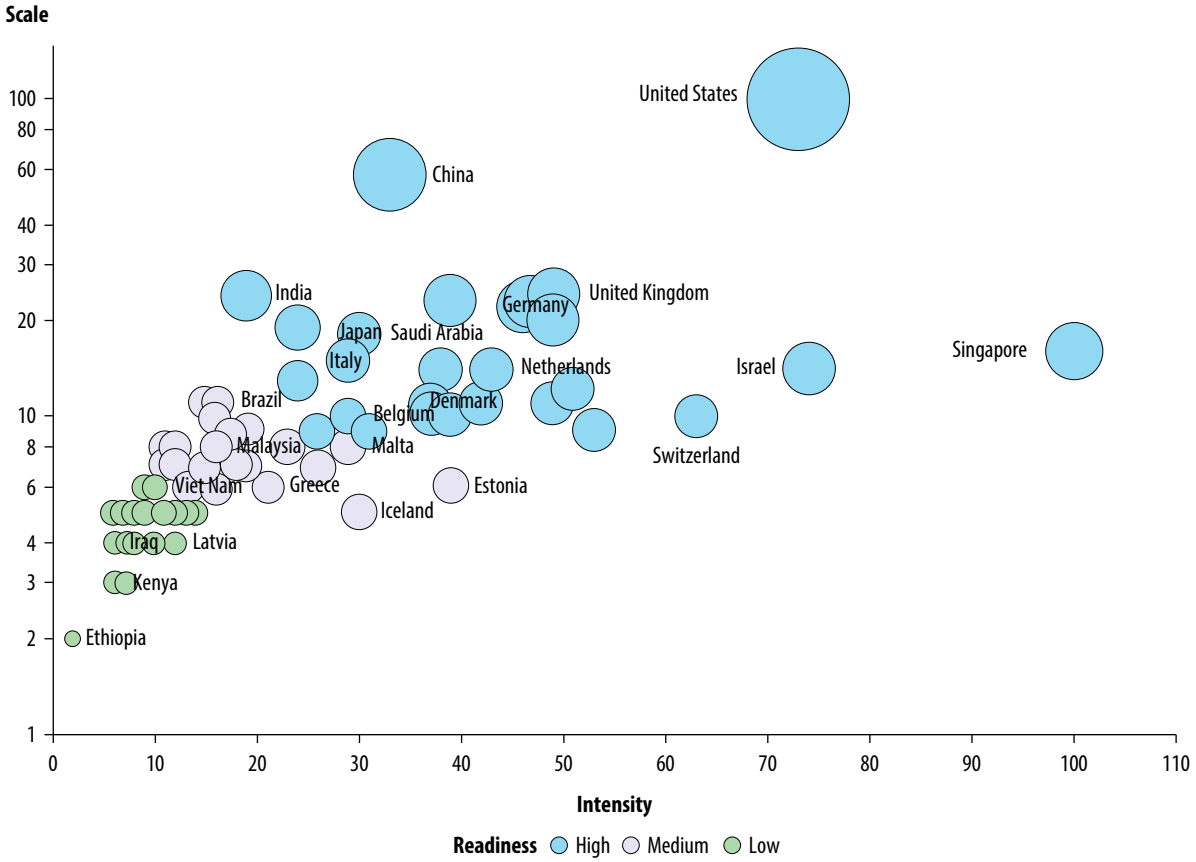
Moreover, scale enables more concentrated and sustained investments in research and development and compute infrastructure—both of which are prohibitively expensive and central to AI leadership. Countries with large markets can justify long-term public and private investment in frontier innovation, from AI chips and data centers to foundational models. They also benefit from talent agglomeration, because researchers, engineers, and start-ups cluster around rich ecosystems of demand, finance, and digital infrastructure. These dynamics are, importantly, self-reinforcing: Early advantages in scale can rapidly snowball into global dominance, as seen in China and the United States. In contrast, smaller and more fragmented economies risk being perpetually dependent on foreign platforms, models, and norms—consumers of AI, not creators or shapers.

Although scale matters for AI innovation, intensity of AI capacity—measured on a per capita basis—is critical for effective AI adoption and diffusion. High per capita availability of compute, training data, and digital skills ensures that AI tools are not just developed but meaningfully used across sectors, firms, and individuals. In countries with low AI intensity, even if aggregate investments are rising, adoption may remain limited to a few cities or elite institutions, leaving most of the economy untouched. Conversely, countries with high AI intensity can embed AI in public services, small businesses, and everyday workflows, enabling more inclusive and widespread productivity gains. Per capita capacity also determines resilience: When AI compute, context, and capacity are widely distributed and locally accessible, more firms, governments, and individuals can experiment, adapt models to local needs, and generate greater value. In essence, AI intensity reflects how deeply the technology penetrates society.

Scale and intensity together determine a country's position in the global AI value chain and its overall readiness to benefit from AI. Countries with great scale are well positioned to attract global investment; lead foundational AI innovation; and develop local compute capacity, training data, homegrown models, and top-notch AI researchers. Their scale creates strong incentives for AI firms to enter, compete, and grow. Smaller countries, although less likely to drive frontier innovation, can still excel by focusing on AI adoption and customization in high-value niches or specific sectors in which local context matters.

Tortoise Media's Global AI Index measures both scale and intensity of a country's AI readiness (refer to figure 6.1). China and the United States dominate in scale because of their vast, digitally mature domestic markets and concentration of compute infrastructure, massive training data sets, and abundant AI firms and talents. In contrast, smaller countries such as Israel, Singapore, and Switzerland rank high on intensity thanks to focused investments and efficient ecosystems. Countries such as France, Germany, and the United Kingdom perform well on both dimensions, combining critical mass with deep penetration. Large middle-income economies such as Brazil and small high-income nations such as Estonia and Iceland fall into the mid-range of AI readiness. Meanwhile, LICs such as Ethiopia and Kenya underperform on both scale and intensity, highlighting the need to invest in foundational enablers such as affordable and high-quality broadband, digital literacy, and workforce skills. For these countries, building readiness means prioritizing the basics that unlock broader AI adoption.

FIGURE 6.1 Country AI readiness level, 2024



Source: Original figure for this publication using calculations from the Tortoise Media's Global AI Index (https://www.tortoisemedia.com/data/global-ai).
Note: AI = artificial intelligence.

In addition to strengthening the foundations, the AI era requires a fundamental rethinking of fiscal, labor, education, and social protection policies and global AI policy coordination and collaboration. Although AI holds great potential, it also risks exacerbating inequality, eroding worker bargaining power, and amplifying global divides. The rising concentration of wealth and job displacement and polarization are top concerns. In addition, AI misalignment (that is, "rogue" AI systems that would not pursue their initial purpose and would instead diverge from human intents) and AI misuse are major risks, particularly for the development or acquisition of chemical, biological, radiological, and nuclear (CBRN) weapons, the exploitation of cybersecurity vulnerabilities, and the production of misinformation and disinformation at scale. Addressing these risks will require coordinated domestic policies and international cooperation.

Some economists argue for steering AI innovation away from replacing humans toward augmenting human capabilities. This includes rethinking how performance benchmarks are designed—focusing less on AI outperforming humans at isolated tasks and more on how AI can complement human judgment, especially in areas such as prediction and decision-making. However, this is difficult to implement. First, complementarity does not guarantee job preservation—if productivity outpaces demand, jobs may still disappear, as seen when tractors reduced the number of farmers despite enhancing productivity. Second, most AI tools today complement rather than fully replace workers,

automating tasks rather than entire occupations. Third, defining benchmarks for augmentation is far more complex than measuring how AI mimics human performance. Moreover, aging populations, labor shortages, and cost pressures give firms strong incentives to develop labor-saving AI systems.

Fiscal policy: Reducing inequality and providing a safety net amid potential disruptions

Fiscal policies must play a larger role in reducing inequality and addressing the winner-takes-most dynamics. Taxation policies could be more progressive and shift from labor income toward taxing other factors and rents. Tax policies that favor capital over labor distort the direction of progress toward saving labor (Acemoglu, Manera, and Restrepo 2020).

Some of the monopoly rents of digital giants can be taxed without introducing major distortions into the economy (Korinek and Stiglitz 2018, 2021). Higher taxes on capital gains, corporate profits, and wealth could fund social programs and worker retraining. However, capital's high mobility in the digital age means individual countries face constraints in raising capital taxes without triggering capital flight. Digital advertising taxes and data usage fees represent novel approaches to capture value from AI-driven business models. Although potentially significant revenue sources, such taxes face implementation challenges, including defining the tax base, preventing pass-through to consumers, and addressing cross-border transactions. In addition, unilateral implementation risks triggering digital trade disputes.

More aggressive redistribution policies, such as universal basic income or expanded social protection, could help ensure AI's benefits reach broader populations. However, financing such programs requires substantial fiscal space—a luxury many developing countries lack, given high debt levels and limited tax bases. The coronavirus disease 2019 pandemic has further strained public finances, constraining countries' ability to implement new social programs just as AI-driven disruption accelerates.

The international dimension presents additional challenges, because AI's benefits tend to concentrate in advanced economies with strong digital infrastructure and skilled workforces. Traditional development assistance may prove insufficient to prevent growing cross-country inequality. New international mechanisms may be needed to redistribute AI gains globally, such as digital development funds or technology transfer programs. However, designing and implementing such mechanisms face significant political and practical hurdles.

Developing countries face additional constraints in implementing redistributive policies. Weak tax administration, large informal sectors, and limited social protection infrastructure make it difficult to identify and reach vulnerable populations. Coordinated global action will be essential to avoid a race to the bottom in taxation and a widening AI divide. However, achieving such coordination will require overcoming significant collective action problems and reconciling divergent national interests.

Labor and education policy: Future-proofing workers

It is important to update labor and education policies to future-proof and protect workers because AI may accelerate the shift toward short-term, precarious employment and create huge uncertainty in skills demand. Predicting the specific skills and training needed for emerging employment opportunities beyond the short term is difficult. AI likely will reinforce the need for an effective lifelong learning system for the workforce (National Academies of Sciences, Engineering,

and Medicine 2025). Intellectual curiosity, critical thinking, general adaptability, social and communications skills, and capacity for continued learning are likely to remain valued worker attributes. Developing these capacities throughout all levels of formal and adult education and training opportunities will be crucial.

Gaps in existing labor regulations have already spurred legislative reforms in multiple countries. For example, the European Union (EU) platform work directive (European Union 2024), approved in April 2024 and adopted shortly afterward, represents a key policy milestone. The directive aims to improve working conditions for platform workers and provide clarity on their employment status (Mirzadeh et al. 2024). Under the directive, a platform worker cannot be fired because of a decision made by an algorithm or an automated decision-making system. The directive also obliges EU countries to establish a rebuttable legal presumption of employment at the national level. Countries such as Costa Rica and Kenya have introduced sector-specific labor regulations, especially in transport.

Several principles can help point policy makers in the right direction when considering how to improve platform work. First, providing clarity on the employment status of platform workers and ensuring minimum rights for all platform workers are key. Second, nongovernmental forms of protection can be used to complement labor regulations. Recently, "platform cooperatives"[1] have been spotted in some sectors, such as transport or home services (Frey and Osborne 2023).

Third, effectiveness also depends on enforcement, which is more challenging for developing countries because of limited administrative capacity to enforce laws and high levels of informal economic activity (Acemoglu 2025). As countries expand legal coverage for platform workers, it is essential to ensure that efforts for enforcement and compliance are adequate. Fourth, data and evaluation can help design more effective regulations. Finally, government regulations and policies should be updated to balance flexibility and protection in the AI era. This often requires tailor-made policies that are based on quality data and a thorough examination of the impacts policy and regulatory changes will bring to workers' lives.

Managing AI risks through trustworthy and responsible AI systems

AI research and adoption are advancing rapidly, but many governments, particularly in developing countries, lack the resources and capacity to effectively manage the new risks that AI brings. A key concern is AI misalignment, in which AI systems optimize for objectives or outputs that diverge from human intentions or from their initial purpose. Misaligned AI behaviors may not be immediately visible and could cause harmful outcomes, especially when AI is applied in critical sectors such as health care or finance. Addressing AI misalignment is not solely a technical challenge: It requires stakeholders to establish processes that ensure AI systems are reliable, predictable, and aligned with public interest objectives before and after deployment (for example, cybersecurity exercises as well as incident detection and response mechanisms).

AI systems are also subject to cybersecurity and privacy risks. First, AI expands the digital attack surface by increasing data flows and system integrations, creating more entry points for adversaries. AI models can also be manipulated with malicious inputs, for example, through prompt injection or data poisoning—causing the system to produce incorrect or unsafe outcomes. Such techniques can enable malicious actors to "jailbreak" AI systems and entirely bypass security filters, undermine public-facing services, and even alter decision-making processes in sensitive domains. These concerns are not speculative; AI incidents are already happening in practice.[2]

Privacy risks are also heightened, because large AI models often process vast data sets containing personal or sensitive information. If effective safeguards are not in place, AI systems may inadvertently expose personal data through their outputs. This is critical in developing countries, where data protection frameworks may still be limited or enforcement capabilities may remain weak.

For policy makers, the priority is not necessarily to create new AI safety regulations from scratch but rather to strengthen the country's practical risk management capacity. Governments can foster compliance with international standards and emerging good practices (for example, the OECD AI principles; International Standard for Organization/International Electrotechnical Commission 42001; and the National Institute of Standards and Technology AI Risk Management Framework) and participate in global initiatives such as the Group of 7 Hiroshima AI Process and the OECD AI Incidents and Risk Repository, which provide platforms for shared learning and collective risk monitoring. Key policy actions include enhancing cybersecurity readiness to address AI-specific vulnerabilities, establishing protocols for incident reporting and response, and ensuring that AI deployments—especially in critical sectors—are subject to clear accountability requirements for safety and data protection.

Government leadership will be essential to coordinating these efforts and prioritizing a risk-based approach to AI safety. This involves setting baseline expectations for AI system reliability and security, working with private sector and international partners to build institutional capacities, and ensuring that AI's benefits can be realized without exposing societies to unmanaged risks.

More broadly, governments in developing countries must continue monitoring the risks associated with AI, such as misalignment, cybersecurity, privacy, CBRN weapons, fairness, algorithmic bias, misinformation, and copyright infringement. AI—and especially GenAI—can turbocharge misinformation, undermine decision-making processes, and distort economic activities (Hajli et al. 2022; Strasser 2023; Suciu 2023). AI platforms rely heavily on extensive data, often sourced from the internet without explicit permission, to train their models (Edelman et al. 2023). Such practices can lead to copyright infringement, posing potential liabilities for both AI platforms and their users. The World Bank (2024b) explores the emerging landscape of AI governance and highlights key considerations, challenges, and diverse approaches to regulating and governing AI.

Government strategies must navigate the ever-evolving and cross-cutting nature of AI, carefully balancing a spectrum of policy objectives, such as economic growth, job creation, transparency, privacy, national security, safety, and inclusion (World Bank 2024a). The intensification of AI's role in defense and critical sectors necessitates stringent cybersecurity measures and ethical considerations to counteract potential misuse, with overregulation posing risks to domestic AI advancements and international competitiveness. Increasing regulatory obligations may impede innovation, particularly for small-scale entities, with the potential for industry leaders to manipulate regulatory landscapes to curtail competition and innovation.

Notes

1. *Platform cooperatives* refers to a project or business that primarily uses a website, mobile app, or protocol to sell goods (for example, data) or services, and relies on democratic decision-making and shared community ownership of the platform by workers and users. As a people-centric model, platform cooperatives prioritize the voices and needs of workers, giving them greater control over its apps, platforms, and protocols (for more details, refer to Scholz 2023).
2. Refer to OECD's AI Incidents and Hazards Monitor, https://oecd.ai/en/incidents.

References

Acemoglu, D. 2025. "The Simple Macroeconomics of AI." *Economic Policy* 40 (121): 13–58.

Acemoglu, D., A. Manera, and P. Restrepo. 2020. "Does the US Tax Code Favor Automation? No." w27052. National Bureau of Economic Research, Cambridge, MA.

Edelman, S. L., P. Kumar, S. G. Rothaus, H. Weingrad, and A. Richman. 2023. "The Risks and Rewards of Generative AI." *Davis+Gilbert Alert, Emerging Issues,* March 31, 2023. https://www.dglaw.com/the-risks-and-rewards-of-generative-ai/.

European Union. 2024. "Directive (EU) 2024/2831 on Improving Working Conditions in Platform Work." *Official Journal of the European Union*. http://data.europa.eu/eli/dir/2024/2831/oj.

Frey, C. B., and M. Osborne. 2023. "Generative AI and the Future of Work: A Reappraisal." *Brown Journal of World Affairs* 30 (1): 161.

Hajli, N., U. Saeed, M. Tajvidi, and F. Shirazi. 2022. "Social Bots and the Spread of Disinformation in Social Media: The Challenges of Artificial Intelligence." *British Journal of Management* 33 (3): 1238–53.

Korinek, A. 2024. "Economic Policy Challenges for the Age of AI," Working Paper 32980. National Bureau of Economic Research, Cambridge, MA.

Korinek, A., and J. E. Stiglitz. 2018. "Artificial Intelligence and Its Implications for Income Distribution and Unemployment." In *The Economics of Artificial Intelligence: An Agenda*, edited by A. Agrawal, J. Gans, and A. Goldfarb, 349–90. Chicago: University of Chicago Press.

Korinek, A., and J. E. Stiglitz. 2021. *"Artificial Intelligence, Globalization, and Strategies for Economic Development,"* w28453. National Bureau of Economic Research, Cambridge, MA.

Liu, Y. 2024. *Generative AI: Catalyst for Growth or Harbinger of Premature De-Professionalization?* Washington, DC: World Bank.

Mirzadeh, I., K. Alizadeh, H. Shahrokhi, O. Tuzel, S. Bengio, and M. Farajtabar. 2024. "GSM-Symbolic: Understanding the Limitations of Mathematical Reasoning in Large Language Models." Preprint, last revised August 27, 2025. arxiv.org/abs/2410.05229.

National Academies of Sciences, Engineering, and Medicine. 2025. *Artificial Intelligence and the Future of Work*. Washington, DC: National Academies Press. https://doi.org/10.17226/27644.

Scholz, R. T. 2023. *Own This!: How Platform Cooperatives Help Workers Build a Democratic Internet*. Verso Books.

Strasser, A. 2023. "On Pitfalls (and Advantages) of Sophisticated Large Language Models." arXiv. Preprint arXiv:2303.17511.

Suciu, P. 2023. "The Next Threat from Generative AI: Disinformation Campaigns." *Forbes,* June 9, 2023. https://www.forbes.com/sites/petersuciu/2023/06/09/the-next-threat-from-generative-ai-disinformation-campaigns/.

World Bank. 2024a. *Digital Progress and Trends Report 2023*. Washington, DC: World Bank.

World Bank. 2024b. *Global Trends in AI Governance: Evolving Country Approaches*. Washington, DC: World Bank. https://hdl.handle.net/10986/42500.