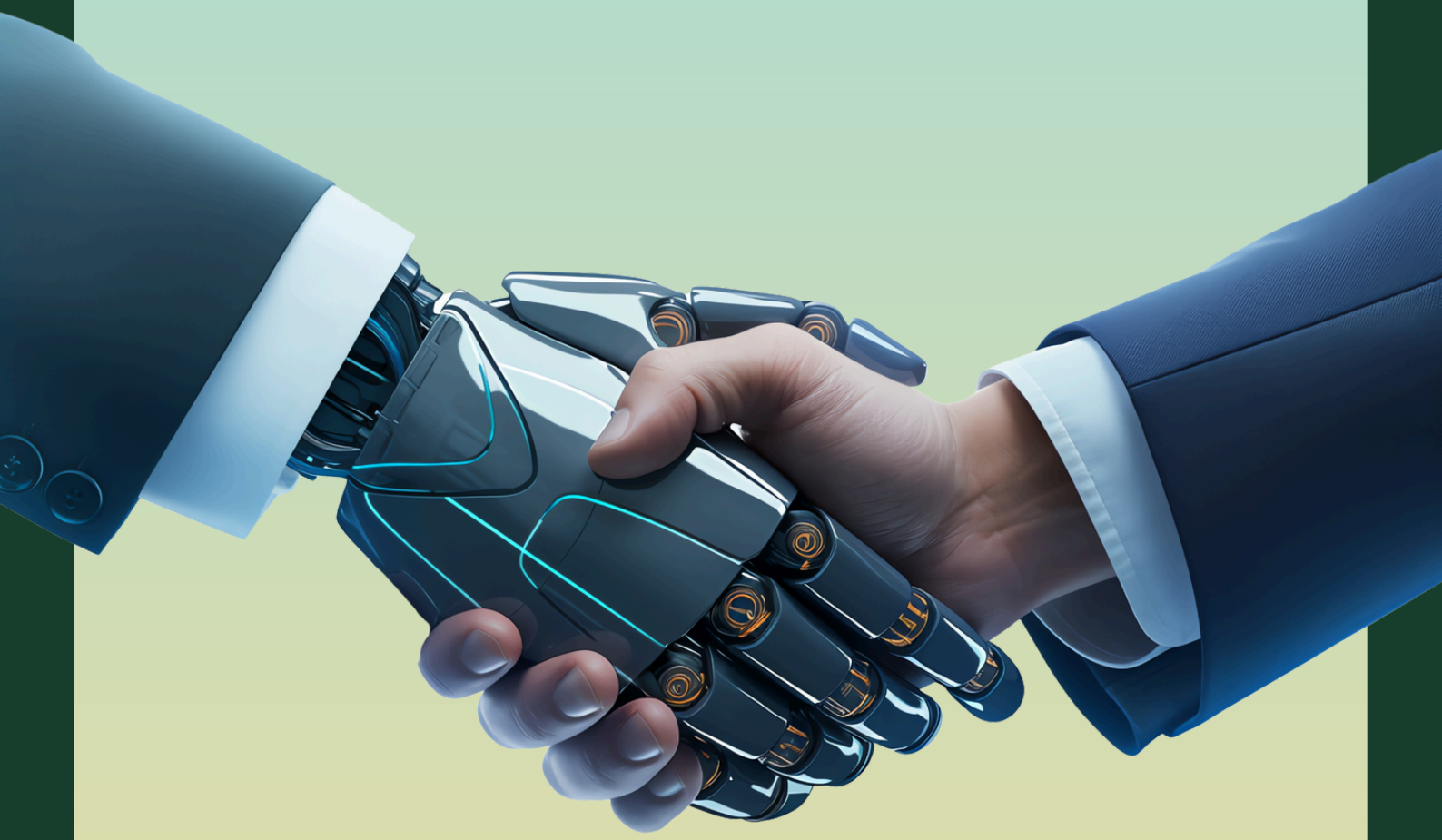
Short Supply

2025

essa CLAYTON



# THE INVISIBLE HANDSHAKE

AN ECONOMICS STUDENT SOCIETY OF AUSTRALIA MAGAZINE

# Short Supply

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# Directors' Foreword

Launched in 2015, Short Supply serves as a platform for economics students and enthusiasts to collaborate and share their ideas on a carefully selected economic theme each year. With writers coming from diverse backgrounds and degrees, we aim to dive deeper into unconventional economic issues and hope that our readers have an insightful and enjoyable read.

We chose the theme The Invisible Handshake as a deliberate play on Adam Smith's concept of the "Invisible Hand". While Smith described the unseen market forces that guide individual self-interest toward broader economic outcomes, we wanted to extend that idea to the interconnected world we operate into today. The Invisible Handshake reflects the interdependencies that define modern economics - the supply chains that span continents, the policy decisions that ripple across borders, and the global dynamics that bind markets together.

This year's issue of Short Supply explores those hidden linkages - the strategic alliances, trade relationships, regulatory frameworks and global flow of labour that shapes outcomes far beyond what is immediately visible. In the era of heightened global complexity, understanding the "handshake" between economic players will be just as important as understanding the invisible hand itself.

This year's Short Supply would not have been possible without the support and tenacity of many people. We would like to wholeheartedly thank our wonderful team of writers for their tireless efforts, inspiring ideas, economic enthusiasm, and dedication of their time not only to our annual magazine, but to our vision and our community. We would also like to thank our numerous supporters, including our sponsors for their continued support and article contributions, our peers, our members, and the ESSA Committee for their dedication to ESSA as a whole.

If you are a Monash student with an interest in economics and a passion for writing, we encourage you to keep a look out for our recruitment opportunities. We would love to expand our family and welcome you to apply when the opportunity arises. Our recruitment process for 2026 can be found on page 25 of this magazine.

Lastly, to our readers, thank you for choosing this year's issue of Short Supply. We hope you gain new insights along your path in the vast world of economic thinking. Happy reading!

**Milena Knight & Emily Rowe**
**Publications Directors 2025**

# President's Address

Dear Short Supply readers,

Thank you for taking the time to explore this year's edition of Short Supply, ESSA's annual flagship publication.

We are proud to present the 2025 theme: The Invisible Handshake, a thought-provoking exploration of global interdependencies and their intersection with digitalisation, AI, and the collection of big data. In a year marked by profound macroeconomic shifts across the world, we hope this edition offers readers an intellectually stimulating lens through which to better contextualise the evolving global landscape.

This magazine is a testament to the hard work, vision, and dedication of ESSA's Publications Team. We are deeply grateful to Emily Rowe and Elly Lau whose editorial direction and unwavering commitment shaped this edition from concept to completion.

We are also grateful to our sponsors for embracing this year's theme and contributing their economic insights accordingly. In particular, we'd like to thank Deloitte Access Economics, HoustonKemp and Mandala Partners for their continued support and invaluable contributions to Short Supply.

We hope this edition of Short Supply not only informs, but also inspires you to think boldly and explore new possibilities in the world of economics.

Kind regards,
**Anh Le**
**2025 President**

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# Personalised Pricing in the Age of Big Data

**Grace Zhou - Bachelor of Laws (Honours) and Commerce**

*It's just past midnight. You open a ride-share app and notice that the fare quoted moments earlier at $19 has just risen to $42. A small surge indicator explains that "demand is high." We have all felt that sting. Prices increasing in response to temporary imbalances between supply and demand. Dynamic pricing, in this sense, is not new.*


Airlines spike fares and hotels charge more during peak seasons, and ride-share apps adjust prices in real time. However, retailers are in a new age of pricing. Artificial Intelligence (AI) is now pushing markets beyond demand-based fluctuations and into something known as personalised pricing. Instead of adjusting prices for everyone in a high-demand period, machine learning models are now increasingly analysing your individual data.[1] As AI becomes more embedded in retail strategy, pricing is transforming from a broad economic mechanism into a data-driven, individualised competitive tool.

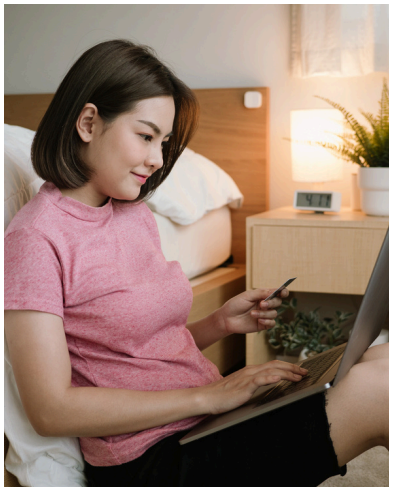
**What is personalised pricing?**

Personalised pricing refers to the differentiation of prices for identical goods or services at the same point in time based on information a firm holds about a particular consumer. Unlike traditional price discrimination models which typically segment consumers into observable groups like students or seniors, AI-enabled personalised pricing can operate at the level of the individual. Drawing on granular behavioural and demographic data such as browsing history, past purchasing patterns, geographic location, device type and engagement metrics such as time spent on a product page, machine learning systems can now estimate a consumer's willingness to pay with increasing precision.[2] Subsequently, firms can calibrate prices to more closely align with these inferred valuations, enabling higher expected profits.

**Real life examples of personalised pricing and implications**

AI is substantially expanding both the scale and granularity at which such strategies can be deployed. E-commerce platforms such as Booking.com, for example, routinely experiment with targeted offers derived from detailed user profiling. These systems ingest and analyse extensive datasets, including clickstream behaviour, time spent on webpages, abandoned shopping carts, geological data, device characteristics and historical purchasing activity.

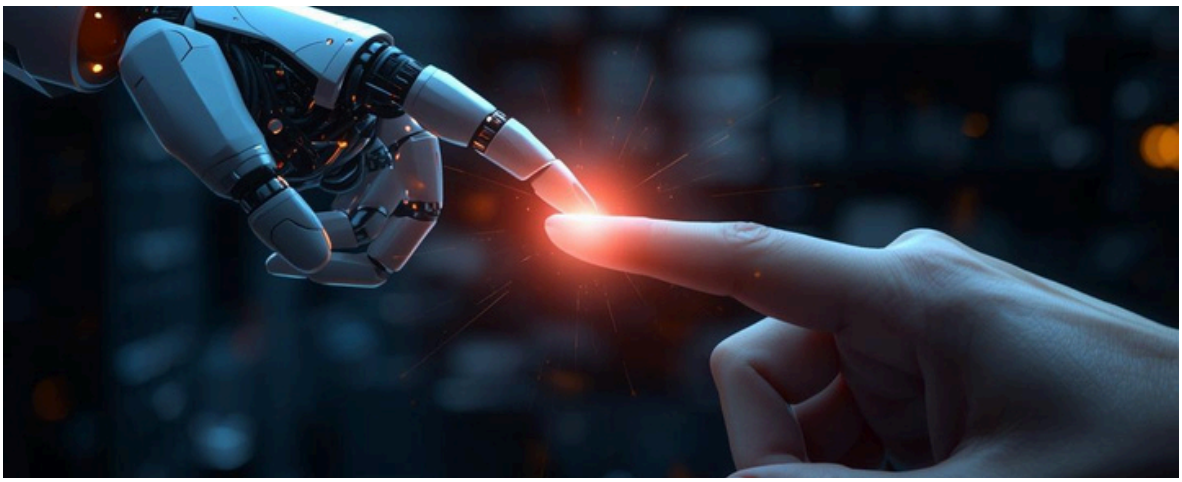
**"Booking.com's predictive modelling used to identify which users should receive tailored offers generated a 162% increase in sales while limiting overall promotional expenditure."** (Garg, 2025)[3]



[1] Callersten J., Bak S., Xu R., Kalthof R. & Bradley S. (2024). Overcoming Retail Complexity with AI-Powered Pricing. Boston Consulting Group. https://www.bcg.com/publications/2024/overcoming-retail-complexity-with-ai-powered-pricing

[2] Rott P., Strycharz J. & Alleweldt F. (2022). Personalised Pricing. Policy Department for Economic, Scientific and Quality of Life Policies Directorate-General for Internal Policies. European Parliament. https://www.europarl.europa.eu/RegData/etudes/STUD/2022/734008/IPOL_STU(2022)734008_EN.pdf

[3] Garg N. 2025. AI is using your data to set personalised prices online. It could seriously backfire. The University of New South Wales, Sydney. https://www.unsw.edu.au/newsroom/news/2025/10/AI-using-data-personalised-data-prices-online



While personalised discounts may benefit consumers with low willingness to pay, higher-income or less price-sensitive consumers may face higher prices. This a phenomenon known as the appropriation effect. The net impact on consumer welfare depends on whether gains to some consumers outweigh losses to others. Empirical evidence suggests strong public resistance to fully individualised pricing. A Dutch survey found that over 80% of respondents considered individual-level personalisation unfair. In the United States, 91% of respondents reported negative attitudes toward supermarkets personalising prices, and 64% responded negatively even to individually tailored coupons. [4] Studies also show that concerns about personal data collection for pricing purposes reduce repurchase intentions. Personalised pricing may also undermine trust between consumers and traders. If consumers discover that data has been used to raise prices without disclosure, trust can erode rapidly. Some critics have even labelled this practice "surveillance pricing." Professor Nitika Garg of UNSW Business School cautions that while AI pricing may maximise profits in the short term, misuse can erode trust. In her view, overreliance on opaque personalisation strategies is both "very short-sighted" and "very risky," particularly if consumers perceive exploitation rather than efficiency.[5] Given that trust is a long-term asset in competitive markets, aggressive personalised pricing may generate short-term gains at the expense of long-term brand equity.

**Policy considerations**

The proliferation of personalised pricing has attracted increasing regulatory scrutiny. In the United States, Transportation Secretary Sean Duffy has publicly expressed concerns about Delta Air Lines' potential use of AI to set individualised airline ticket prices.[6] Although Delta has stated that it does not deploy AI to personalise fares, regulators have signalled a willingness to intervene should firms attempt to individualise seat pricing on the basis of personal attributes.

In Australia, price discrimination is legal provided it does not discriminate based on protected attributes (such as race, gender, age or disability) or substantially lessen competition. However, regulators are increasingly focused on algorithmic transparency. The Australian Competition and Consumer Commission (ACCC) has identified algorithmic transparency as a 2025 priority.[7] Although Australia does not yet have AI-specific legislation, the Australian Consumer Law under the Competition and Consumer Act 2010 is under review to address potentially unfair practices, including opaque dynamic pricing.[8] Professor Garg notes that regulation often lags technological innovation.[9] Firms may experiment aggressively with AI pricing before clear regulatory boundaries are established, increasing the risk of misuse.

Policy discussions also increasingly focus on disclosure obligations. Three levels of transparency have been proposed: informing consumers that prices are personalised, explaining the parameters used in personalisation, and disclosing how a personalised price compares to standard or other customers' prices. Such disclosures could mitigate fairness concerns while preserving legitimate business innovation. As these AI systems become more deeply embedded in market practice, their long-term viability will hinge on whether firms can reconcile revenue optimisation with transparency, accountability and the preservation of consumer trust.

[4]Rott P., Strycharz J. & Alleweldt F. (2022). Personalised Pricing.
[5]Garg N. (2025). AI is using your data to set personalised prices online. It could seriously backfire.
[6]Ticha V. 2025. The evolution of dynamic pricing: should AI decide what you pay? The University of New South Wales, Sydney. https://www.unsw.edu.au/newsroom/news/2025/09/dynamic-pricing-AI-decide-what-you-pay
[7]Australian Competition and Consumer Commission. 2025. Digital platform services inquiry final report. Australian Competition and Consumer Commission. https://www.accc.gov.au/system/files/digital-platform-services-inquiry-final-report-march2025.pdf
[8]Ibid.
[9]Garg N. (2025). AI is using your data to set personalised prices online. It could seriously backfire.

# AI Recruitment's Dual Impact on Employers and Employees

**Elly Lau - Bachelor of Politics, Philosophy and Economics / Arts (Psychology major)**

*You sit alone in your bedroom, facing your laptop webcam, awaiting the start of your interview. On the other side of the screen, your recruiter carries a faintly uncanny expression, enunciating and pausing between certain words no human typically stresses. This recruiter is no human, but an AI system rendered with a replicated human face.*

Unbeknownst to the firm, you open your on-demand AI interview extension: its instant answer suggestions meant only minimal, if any, prior preparation from you was necessary.

This scenario is no longer speculative. It reflects a growing reality in which AI systems mediate key decisions across recruitment. While AI automation promises efficiency, it also introduces co-dependencies and ethical trade-offs. What emerges is a subtle but revolutionary arrangement between employers and employees. Unlike formal contracts, these implicit, invisible handshakes are embedded in decision protocols and shape outcomes. This article addresses AI-driven operations from the perspectives of both the firm and the worker, and the implications on ESG targets and critical thinking at large.

**Step 1: Screening the Candidates**

Upon receiving hundreds of applications, your prospective firm is short of manpower to comb through each and every candidate. Instead, it utilises an AI screening tool to automatically filter applications based on predetermined criteria, and identify the most promising candidates within hours rather than weeks.

First, it is noteworthy to clarify that there is a distinct difference between using AI to sort and to create. HR departments' usage of 'traditional' AI maximises efficiency by scanning for keywords and sifting through resumes. However, candidates use generative AI, such as ChatGPT or Perplexity, to assist in application writing or behavioural question practice.

The duty of acquiring and retaining the best talent promptly is always the priority of HR.[1] Understandably, AI-automated processes give firms clear benefits, such as money and labour savings, speed improvement and task efficiency. Given the demands of identifying the most suitable candidates – including administering personality assessments, cognitive ability tests, behavioural tests and situational tests – many organisations have turned to AI systems for candidate screening. In fact,

**...it is now understood that 42% of global companies use predictive AI systems in recruitment.** (Lytton, 2024)[2]

The appeal is clear: AI screening has proven to be highly effective in streamlining recruitment processes and improving operational efficiency. And, it is this efficiency that allows recruiters to process larger volumes of applications while focusing human attention on the most promising candidates. After all, if you can examine 1 million candidates, you increase your chances of landing 10 outstanding candidates than if you only screen 1000.

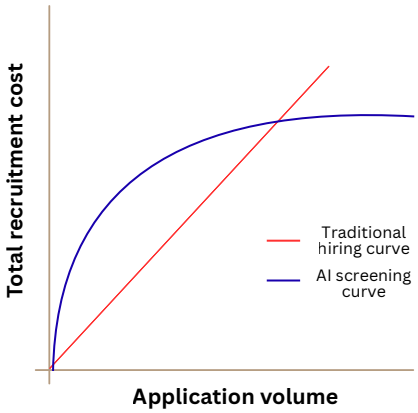
From an economic perspective, this represents a seismic shift in the production function of recruitment.

[1] Green, David. 2017. "The best practices to excel at people analytics." *Journal of Organizational Effectiveness: People and Performance* 4, no. 2 (June): 137-144. https://doi.org/10.1108/JOEPP-03-2017-0027.

[2] Lytton, Charlotte. 2024. "AI hiring tools may be filtering out the best job applicants." *BBC*, February 16, 2024. https://www.bbc.com/worklife/article/20240214-ai-recruiting-hiring-software-bias-discrimination.

[3] Danks, David, and Alex J. London. 2017. "Algorithmic Bias in Autonomous Systems." *Proceedings of the Twenty-Sixth International Joint Conference on Artificial Intelligence* (August): 4691-4697.

Traditional hiring processes required large variable costs in the form of human reviewer time, which scaled linearly with application volume. AI screening has changed this into predominantly fixed costs – the initial investment in AI systems and training data – while reducing marginal costs per application reviewed. With increased economies of scale, large firms with high application volumes can achieve great cost savings per hire.




However, the substitution of human judgement with algorithmic automation introduces certain risks. The reliance on historical hiring data for training these AI systems has introduced concerns about amplifying existing workplace biases. AI algorithms are only as good as the data on which they are trained; if that data is biased, so are the algorithms.[3] Australia's Human Rights Commissioner Lorraine Finlay warns that "algorithmic bias means that bias and unfairness is built into the tools that we're using, and so the decisions that result will reflect that bias".[4] The concern is particularly acute when combined with automation bias, where "humans are more likely to rely on the decisions of machines and almost replace their own thinking," creating increasingly subtle forms of discriminatory decision-making.[4]

This bias creates allocative inefficiencies in the labour market. Recent research supports these concerns: a study published by Melbourne Law School found job candidates who are interviewed by AI recruiters will likely be discriminated against if they belong to racial and ethnic minorities, are transgender or live with a disability.[5]

Furthermore, the usage of AI-supported selection tools without explanations threatens procedural justice and has been found to decrease the perception of fairness and personableness in applicants.[6] This demonstrates how AI screening systems can perpetuate discrimination against already marginalised groups, where optimal talent allocation is compromised by algorithmic bias.

**Step 2: Researching the Firm**

Having identified the most suitable candidates through AI screening, the firm now schedules interviews with the shortlisted applicants. While your prospective employer uses AI to evaluate you, you too have enlisted artificial intelligence as your research assistant. Armed with advanced search algorithms and AI-powered research tools, you systematically investigate the company's workplace culture and strategic direction.

As more job seekers are using AI for interview preparation, the traditional information asymmetry once heavily favouring employers is rapidly eroding.[7] Historically, employers possessed superior information about candidate evaluation criteria which created selection problems where candidates could not adequately signal their fit. As a candidate, you now possess unprecedented investigative capabilities through AI-powered research tools that can analyse high-level documents such as company reviews, financial reports and industry positioning within minutes. This democratisation of information manifests into a shift in bargaining power within the labour market.

While this seemingly places more candidates at an advantage, this becomes a problem when AI users are disproportionately benefited compared to those who do not use AI. In a recent study, candidates who used such tools to prepare for their interviews received higher overall interview performance ratings compared to those who did not.[8] When AI-assisted candidates consistently outperform their unassisted peers, it suggests that access to these tools is a prerequisite for competitive participation in the job market, potentially creating new forms of digital inequality.

From a game theory perspective, this creates a prisoner's dilemma-esque payoff matrix. Rational (or, further, self-interested) behaviour – adopting AI tools – leads to collectively suboptimal outcomes – AI overreliance with questionable net benefits. While the Nash equilibrium involves all parties using AI, it may be Pareto inefficient to a coordination strategy profile that limits AI use while maintaining more authentic processes.

**Step 3: Conducting the Interviews**

Before you know it, interview day arrives. You join the video call precisely on time, your camera positioned at an optimal angle that shows off your prim attire, and your background carefully tidied to project professionalism. The interviewer appears on screen with that same faintly mechanical cadence – the telltale signs of an AI-powered recruitment system. Simultaneously, your own AI assistant that feeds real-time suggestions based on the company research you conducted lies discretely in front of your browser. When asked about your experience with previous stakeholder management experience, you weave in insights about the company's recent strategic partnerships: information your AI research had flagged as particularly relevant to this role.

**Neither party acknowledges what is happening.**

[4] Dhanji, Krishani. 2025. "Use of AI could worsen racism and sexism in Australia, human rights commissioner warns." *The Guardian*, August 13, 2025. https://www.theguardian.com/technology/2025/aug/13/ai-artificial-intelligence-racism-sexism-australia-human-rights-commissioner.

[5] Sheard, Natalie. 2025. "Algorithm-facilitated discrimination: a socio-legal study of the use by employers of artificial intelligence hiring systems." *Journal of Law and Society* 52, no. 2 (June): Pages 269-291.

[6] Köchling, Alina, and Marius C. Wehner. 2023. "Better explaining the benefits why AI? Analyzing the impact of explaining the benefits of AI-supported selection on applicant responses." *International Journal of Selection and Assessment* 31, no. 1 (March): 45-62. https://doi.org/10.1111/ijsa.12412.

The interviewer does not (rather, unable to) identify that your generic responses are being produced by algorithms. You do not reveal that your articulate answer about industry trends was crafted with AI assistance just moments before. The conversation flows on with an eerie seamlessness.

AI-powered interviews are advertised to revolutionise the process by increasing screening capacity, allowing flexibility for interviewees to conduct interviews anytime, and relieving recruiters from monotonously standardised activities. On the flip side of this, a near-perfect interview performance does not suffice as worthy testimony that the successful candidate is as capable as they proclaim to be.

AI tools frequently generate false information by turning "assisted on XYZ project" into "lead XYZ project." More concerningly, AI systems sometimes fabricate metrics and accomplishments entirely. When employers detect such discrepancies between resume claims and actual performance, it undermines trust and calls candidates' integrity into question. This authentication crisis extends naturally to the interview process. If candidates can use AI to generate responses in real-time, how can employers distinguish between fabricated credentials and genuine competency? Organisations are responding by shifting towards multi-measure talent assessments: in 2025, 94% of employers agreed that skills-based assessments were more predictive of job performance than CVs.[9] Even then, candidates can still rely on external resources, such as the ChatGPT application on their phone, to cheat on pre-employment assessments.

**The dissonance between AI usage and ESG Goals**

We cannot talk about AI without acknowledging its drastic impacts on the environment. While AI usage becomes commonplace in almost every facet of everyday life, its carbon footprint remains a growing concern. Training large-scale models requires immense computational power, which consumes vast amounts of electricity and water for cooling data centres. Recent estimates suggest that developing a single advanced AI system can emit more carbon than five cars over their entire lifetimes.[10] In the name of sustainability reports, companies may face increasing scrutiny over whether AI-enabled hiring truly aligns with sustainability commitments.

Demand for AI transparency is echoed by policymakers. The EU AI Act, for instance, requires businesses to categorise AI systems into distinct risk levels. In Asia, South Korea recently passed a wide-ranging national AI framework, while other countries such as China are developing targeted rules for generative and algorithmic technologies. With half the global population living in water-scarce areas, there is growing expectation that organisations will begin to include these resource impacts in their sustainability materiality assessments, particularly where data centres and supply chains intersect with vulnerable ecosystems.


Sustainability reporting frameworks such as the European Sustainability Reporting Standards and the IFRS Sustainability Disclosure Standards offer a structured avenue for disclosing AI strategies, governance, risks and opportunities. For example, the effects of AI on workforce dynamics, environmental impacts or broader communities can be reported on using the sustainability materiality lens. This will enable companies to demonstrate responsible oversight.

Addressing the ESG dimensions of AI requires proactive corporate strategies: investing in greener infrastructure, embedding fairness in algorithms and adhering to transparent governance practices.

**Only then can AI innovation be considered sustainable and socially responsible.**

**Conclusion**

AI recruitment is reshaping the tricky balance between maximising efficiency, and maintaining core principles of equality and sustainability. This has been creating new precedents for both employers and employees to adapt to new norms. To truly harness its benefits, organisations must align AI adoption with ESG principles, while ensuring transparent and human-centric responsible practices.

[7] Kwok, Navio. 2025. "When Candidates Use Generative AI for the Interview." *MIT Sloan Management Review.* https://sloanreview.mit.edu/article/when-candidates-use-generative-ai-for-the-interview/.

[8] Canagasuriam, Damian, and Eden-Raye Lukacik. 2025. "ChatGPT, can you take my job interview? Examining artificial intelligence cheating in the asynchronous video interview." *International Journal of Selection and Assessment* 33, no. 1 (February): 1-16. https://doi.org/10.1111/ijsa.12491.

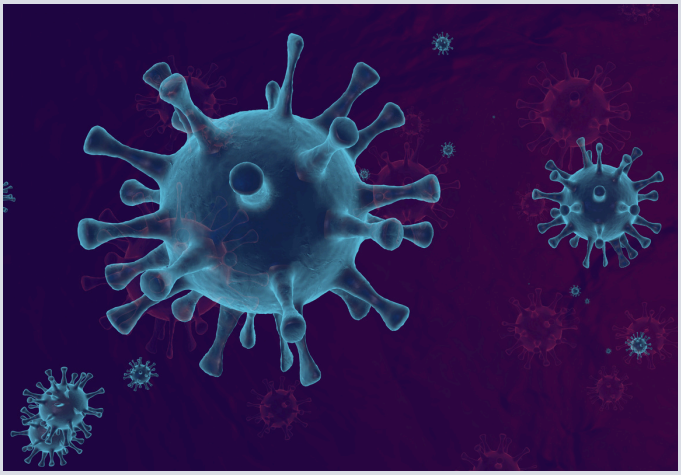
[9] TestGorilla. 2025. "The State of Skill-Based Hiring 2025." *TestGorilla*. https://www.testgorilla.com/skills-based-hiring/state-of-skills-based-hiring-2025/.

[10] Strubell, Emma, Ananya Ganesh, and Andrew McCallum. 2019. "Energy and Policy Considerations for Deep Learning in NLP." *57th Annual Meeting of the Association for Computational Linguistics*, (July). https://doi.org/10.48550/arXiv.1906.02243.

# From Data to Response: Laying the Foundations of Next-Generation Disease Surveillance

**Tyler Tranquille - Senior Consultant at Deloitte Access Economics**

*This essay highlights the impact of inadequate disease surveillance systems and explains how, by drawing on abundant data sources and emerging technologies, all countries—regardless of their size or capabilities—can contribute to and benefit from global disease surveillance and reporting efforts.*



**The threat of weak disease surveillance**

The COVID-19 (coronavirus disease 2019) pandemic was the largest in modern history: close to 800 million recorded cases, around seven million confirmed deaths, and well over twenty million estimated deaths once excess mortality is considered.[1] In historical terms, the impact—in terms of lives lost and strain on systems—could have been far worse. As UN Secretary-General António Guterres put it, COVID-19 was a "wake-up call to the world," a warning to prepare for what comes next.[2]

Despite this, the global financial burden of COVID-19 was unprecedented. It is estimated that COVID-19 contributed to ~US$11 trillion in direct response costs and ~US$10 trillion in longer-term losses from reduced productivity due to long COVID and labour losses. The actual costs are likely higher than this, attributable to delays in care, mental health burdens, educational disruption, and other factors that are inherently difficult to quantify. Crucially, prevention and preparedness are vastly cheaper than crisis response, at ~US$5 per person per year or ~US$39 billion—roughly 500 times less than the response costs (see Figure 1).[3]

## A core lesson follows: pandemics are global *by definition*.

They move with people, ships, planes—and sometimes animals—meaning no country can achieve resilience in isolation. Where surveillance data systems have gaps, pathogens exploit them, and even well-resourced nations can be overwhelmed.

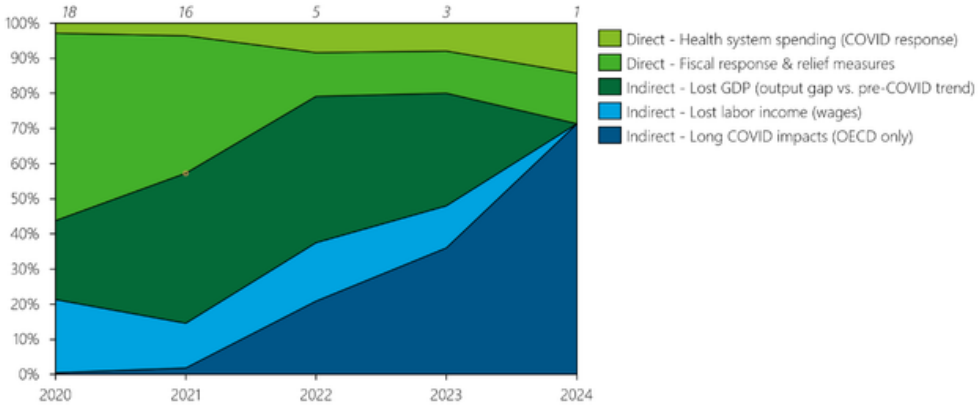



*Figure 1: COVID-19 pandemic costs by type (% of total expenditure)*

[1]Our World in Data — COVID-19 cases and deaths (global overview and excess-mortality context). https://ourworldindata.org/covid-cases

[2]United Nations — Secretary-General's message: International Day of Epidemic Preparedness. https://www.un.org/en/observances/epidemic-preparedness-day/messages

[3]Global Preparedness Monitoring Board / WHO (as summarised by WEF) — Preparedness vs response costs (~US$11T direct + ~US$10T future losses). https://www.weforum.org/stories/2020/10/economic-cost-covid-global-preparedness-monitoring-board/

[4]Durrheim DN, Baker MG, et al. Strengthening global disease surveillance—lessons from COVID-19. https://pmc.ncbi.nlm.nih.gov/articles/PMC8767077

[5]Australian Government — Health Portfolio Budget Statements, 2023–24. https://www.health.gov.au/resources/publications/health-portfolio-budget-statements-budget-2023-24

[6]Australian Health Review (2025) — Commentary noting ~A$950m federal digital-health investment in 2023–24. https://www.publish.csiro.au/AH/fulltext/AH25039

These gaps are most evident in low- and middle-income countries (LMICs), where limited capacity can delay detection and reporting, but high-income countries (HICs) also experienced similar types of shortfalls during COVID-19. For example, reviews of Australia's national response found significant weaknesses in preparedness and coordination, including fragmented surveillance systems and unclear lines of authority, resulting in a commitment to establish a national Centre for Disease Control (CDC) in 2024.[16] [17] Across regions, the evidence is clear: when surveillance capacity is weak, the timely recognition and containment of outbreaks is compromised.[4]

An effective public health response relies on four linked capabilities: data collection, reporting, analysis, and response. Each is essential to detect threats early, make sense of the signals, and act. **This essay focuses first on the inputs: data collection and reporting.** Without reliable, timely inputs, even the best analysis and response cannot compensate—and may, in some cases, worsen outcomes or introduce unnecessary costs. In short, the question is how can we convert messy, underutilised data into standardised signals that can travel across borders and inform policy action.

In principle, improving data collection is straightforward: generate useful, timely signals that authorities can use to detect disease agent—either directly by identifying a pathogen such as SARS-CoV-2, influenza virus, or poliovirus, or indirectly through proximate markers or clinical presentations consistent with infection. Many sectors already collect relevant data through existing systems, meaning that most countries sit on substantial reservoirs of untapped information—from wastewater surveillance and transport flows (people and goods) to demographic and health records, pharmacy purchasing spikes (e.g., ibuprofen), and social-media symptom chatter—all of which were used extensively during COVID-19. Yet volume is not value: these datasets are often unclean, unlinked, and hard to interpret, making them unsuitable for timely reporting.

**AI as an insight layer**

Recent advances in artificial intelligence (AI)—particularly in applied machine learning methods such as natural language processing (for unstructured text and clinical data), time-series forecasting (for tracking changes in cases or symptoms over time), and federated learning (for training models across sites without moving raw data)—offer a practical way to transform existing datasets into decision-ready signals. This 'AI-enabled approach' creates an *insight layer* that runs locally (*in situ*), meaning that instead of pooling all data into a single central system, algorithms are deployed where the data already reside. These tools clean and link records, detect anomalies across time series, and generate short, standardised summaries that answer specific surveillance questions—such as identifying unusual case clusters or early wastewater signals—without transferring sensitive information. This approach is practical for both LMICs and HICs, as it strengthens local analysis capability while reducing dependence on large, centralised digital infrastructure. [11] [12]

**AI also reduces capital outlay requirements.** National digital-health programs routinely cost hundreds of millions of dollars. For example, Australia's 2023–24 Federal Budget committed substantial funding to modernising national systems and stabilising the Australian Digital Health Agency, while peer-reviewed commentary placed total federal digital-health investment over four years at approximately A$950 million.[5] [6] For many countries, such costs are prohibitive. A more feasible alternative may be to invest in basic connectivity, lightweight data pipelines, and local operators, while leveraging AI to compress messy inputs into trend summaries, risk scores, and variant flags that can be shared in common formats at a fraction of the cost.

A tailored approach to data sharing is necessary to balance data governance and privacy considerations. Centralised pooling of data can result in both oversharing (creating privacy and security risks) and undersharing (which weakens analytical capability). In contrast, running models on local data and sharing only the outputs—rather than the raw inputs—preserves national data sovereignty while still enabling coordinated action. This decentralised model aligns with World Health Organization (WHO) guidance on genomic data governance, which emphasises privacy-by-design and granular consent, and reflects the preferential use of restricted-access early warning systems such as the European Union's (EU) Early Warning and Response System (EWRS), which exchanges actionable signals to coordinate multinational responses.[7] [8]

**AI technologies are not sufficient in and of themselves.** For LMICs, the effectiveness of this insight layer still relies on several core fundamentals: digitised health records, reliable data networks, clear output standards, adequately trained staff, and periodic model evaluation to manage drift and bias. Additional independent verification of reporting is also essential to validate outputs, reduce false positives, and ensure that reported trends accurately reflect conditions on the ground. (9), (10) Together, these elements point to a concrete operating model: define what information must be shared, ensure outputs are generated in a comparable way, and align access and benefits with transparent verification.

**Foundations of an AI-enabled global surveillance network**

The goal is to turn diverse local datasets into standardised, decision-ready signals that can move and be used across borders while raw data remain local. In practice, this rests on three foundations: a minimum

[7] WHO (2024) — Guidance for human genome data collection, access, use and sharing. https://www.who.int/publications/i/item/9789240102149

[8] ECDC (2025 update) — Early Warning and Response System (EWRS); 2024–2029 contribution agreement. https://www.ecdc.europa.eu/en/publications-data/early-warning-and-response-system-european-union-ewrs

[9] CDC NWSS — About wastewater data. https://www.cdc.gov/nwss/about-data.html

[10] CDC NWSS — Data methodology; Wastewater Viral Activity Level (WVAL). https://www.cdc.gov/nwss/data-methods.html

[11] Nature Water (2025) — Augmentation of wastewater-based epidemiology with machine learning. https://www.nature.com/articles/s44221-025-00444-5.pdf

[12] UKHSA Research Portal (2025) — Augmentation of WBE with machine learning. https://researchportal.ukhsa.gov.uk/en/publications/augmentation-of-wastewater-based-epidemiology-with-machine-learni

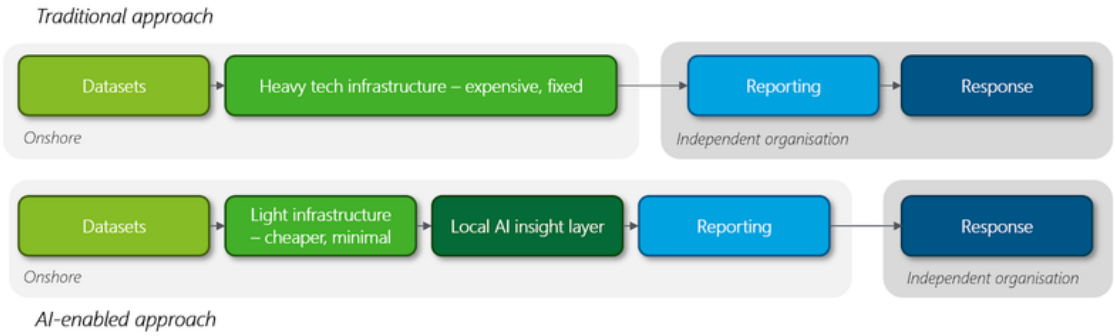



*Figure 2: comparison between traditional and AI-enabled approach to disease surveillance*

shareable output, local models for global comparability, and reciprocity with independent validation (see Figure 3).

- **Foundation 1: Minimum shareable outputs.** Identify and agree on the highest-impact outputs that every country should publish on a regular schedule, starting with those that can be most easily generated using existing capabilities. These may include case trends and excess-mortality signals, key genomic flags (such as lineage shifts or unusual constellations of mutations that may alter transmissibility or severity), and relevant ecological context—factors like seasonality, temperature, or animal vectors that influence disease transmission. The priority should be to keep the reporting template simple and consistent, so it is easy to use, adding extra sections only when a new threat makes it necessary. Where possible, these outputs should align with existing international data structures and reporting systems and with established governance principles such as those outlined in the WHO Global Genomic Surveillance Strategy. Aligning to these standards helps ensure that data interoperate smoothly with laboratory workflows, genomic pipelines, and regional platforms, making results easier to compare and act upon across borders.[13] [14]

- **Foundation 2: Local models.** Next, develop and run the models in situ using national or regional infrastructure to clean, link, and summarise local data into the minimum outputs established in Foundation 1. Publish version data and lightweight metadata (e.g., model version, coverage, most recent calibration) to ensure that signals remain comparable across regions. For LMICs located close to one another and lacking the requisite labour or computing resources, regional hubs—such as the Africa CDC—can be established to form regional stacks, meaning shared regional infrastructure for data processing, analysis, and reporting that supports the insight layer and generates comparable outputs while keeping datasets local. While this approach requires cooperation, it is mutually beneficial—strengthening each country's ability to respond while also reducing overall costs. While this requires a level of cooperation, it is mutually beneficial for both countries in terms of their ability to respond, but also for minimising their costs.

- **Foundation 3: Reciprocity and verification.** Finally, give contributors access to both the global view and each country's minimum outputs, and link timely reporting to tangible benefits—such as vaccine or antiviral allocation windows, surge financing, or deployable laboratory support. Maintain independent verification layers, including wastewater surveillance, sentinel laboratories, and targeted field investigations, to compare reported signals with conditions on the ground and to detect model drift or data suppression. Use restricted-access channels—such as the EU's EWRS for sensitive alerts and coordinated action without requiring broad raw-data transfers.[8] [7]

**Equal footing**

COVID-19 was an unfortunate but necessary wake-up call for countries to invest in disease surveillance. For many governments, however, allocating enough resources remains difficult, especially as the cost of building and maintaining public health infrastructure continues to rise. These challenges vary across countries but can only be solved through collective effort. Disease surveillance is a shared responsibility, and coordinated action across borders is essential. Yet, historically, only a few countries have had the resources, expertise, and commitment to build and sustain the systems required.

To prepare for the next pandemic while keeping costs manageable, countries must find new and efficient ways to strengthen their systems. Technological progress offers one such opportunity. Advances in AI represent a

[13] WHO — GISRS / RespiMart overview: harmonised respiratory surveillance data. https://www.who.int/tools/RespiMart
[14] WHO — Global Genomic Surveillance Strategy 2022–2032. https://www.who.int/publications/i/item/9789240046979
[15] Africa CDC — Africa Pathogen Genomics Initiative (PGI 2.0). https://africacdc.org/africa-pathogen-genomics-initiative-africa-pgi/
[16] Australian Government, Department of the Prime Minister and Cabinet. Implementing the Australian Centre for Disease Control: Summary report—Lessons for the next crisis. 2024. Available at: https://www.pmc.gov.au/resources/covid-19-response-inquiry-summary-report-lessons-next-crisis/implementing-australian-centre-disease-control
[17] Australian Government, Department of Health and Aged Care. Establishing the Australian Centre for Disease Control (Factsheet). 2025. Available at: https://www.cdc.gov.au/sites/default/files/2025-01/establishing-the-australian-centre-for-disease-control.pdf

step-change in capability, allowing LMICs to expand surveillance without the high costs of large-scale infrastructure.

As outlined in this essay, the starting point lies in three key foundations: establishing minimum shareable outputs, developing local models, and implementing verification systems. Together, these foundations create an approach that is transparent, accurate, and practical. **The task now is for the world to take action—through collaboration, investment and technology—to ensure that when the next pandemic emerges, we are *all* prepared.**

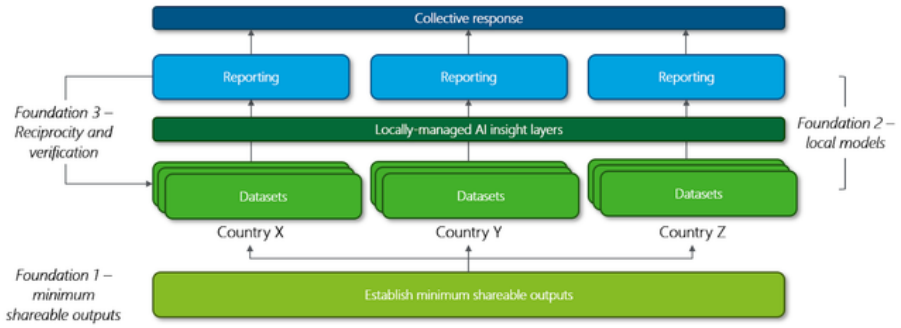



*Figure 3: Foundations of an AI-enabled global surveillance network*

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- Organisation for Economic Co-operation and Development (OECD). The impacts of long COVID across OECD countries. June 2024. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/06/the-impacts-of-long-covid-across-oecd-countries_f662b21c/8bd08383-en.pdf


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# The Cognition Crisis and the Attention Economy

**Nathan Wong - Bachelor of Engineering (Honours) and Commerce**

*Once a scarce resource, information has become so abundant in the digital economy that our ability to interact with it is now bounded only by the limits of our attention. In 1971 economist Herbert Simon remarked that "a wealth of information creates a poverty of attention".[1] More than half a century later, the 'attention economy' looms larger than ever.*

What was once relegated to dusty libraries or ungainly volumes of expensive encyclopedias now resides only a few clicks away. Wikipedia alone already has more than 63 million pages, and even more staggering is the volume of video and audio material on the internet. Approximately 720000 hours—that's 82 years—of video are uploaded to YouTube every single day.

This motif, of attention scarcity and information saturation, has transformed the economic landscape. In the attention economy the limited resource is not land, or labour, or raw materials, but our very attention, which essentially becomes the price of information. No wonder, then, that advertisements spring forth from every nook and cranny of the internet, or that sophisticated social media algorithms monitor our every click, like, and comment, churning out often extreme, polarising, or shocking content to keep us hooked. And for this purpose, technology giants collect our data on a frightening scale, because the more social media companies can win our attention, the more in advertising revenue they earn. It's working too—global advertising revenues in 2024 totalled $933 billion, up 10% from 2023, with this figure only expected to continue growing.[2]

The economic and social risks of this reality have not gone unnoticed. Rampant online misinformation—the number one global short-term risk according to the World Economic Forum's 2024 Global Risk Report 2024[3]—is just one of the social implications of this environment. In addition, the UN[4] has highlighted the dangers of industrial data harvesting being weaponised by governments to control its citizens. These are some of the large scale implications; but what are the implications for the individual? More specifically, how does the commodification of our attention affect our behaviour, our ways of thinking and working, and, perhaps, even our rationality, as economic agents?

**"...most users of digital platforms are unaware of the algorithms working in the background that increasingly disempower them to act in their own best interest."** (United Nations, 2023)[4]

**Information saturation**

For most of human history, information was precious. In, say, the Medieval times, knowledge was hard to come by because the production of books was highly costly and time-consuming. Today, the situation is flipped; all the information is there, but we can't learn everything. And when there is as much content as there is on the sprawling, unkempt metropolis that is the internet, the outcome is a loss of high-quality information to the superficial, the shocking, the popular. Even worse, our natural cognitive biases only enhance our vulnerability to misinformation and disinformation. For example, we are drawn to information

[1]Simon, H. A. (1996). Designing organizations for an information-rich world. *International Library of Critical Writings in Economics*, *70*, 187-202.

[2]Bonner, N. (2024). *MAGNA Advertising Forecast: Media Innovation to Propel the Global Ad Market Towards the Trillion Mark - IPG Mediabrands*. IPG Mediabrands.
[3]World Economic Forum. (2024). Global Risks Report (p. 8). World Economic Forum.

[4]Carpentier, C. L., Cheng, H. W. J., Jackobs, A., Roehrl, R., Klauer, P., & Doerfler, K. (2023). ATTENTION ECONOMY. United Nations Economist Network. *https://www.un.org/sites/un2.un.org/files/attention_economy_feb.pdf*

that confirms our existing stances (confirmation bias); we tend to believe something from in-group sources; and if the crowd says something is so, then it must be so (herding). This is not even to mention emotional factors also at play. Anxiety, anger, frustration—they all cloud our judgement and analytical capabilities.

**Cognitive atrophy**

The attention economy harnesses these existing biases to the utmost. The personalised recommendations of search engines and social media algorithms serve us stories that are likely to keep us scrolling, and often these stories are based on the influencers we follow and the views we are likely to agree with, no matter the quality of the information itself. Because, after all, if we are served this content so that our attention and data can be harvested, to be fed back into the cycle of social media consumption, then the goals of communicating information and knowledge and engaging in thoughtful discussion become secondary. The result? Content becomes valued not because of its depth, or its veracity, or its potential to spark meaningful discussion, but because of its popularity, its potential to become viral with the masses, and its ability to garner clicks and likes.

The danger of this shift lies in the ubiquity of such content leading to a decline in fundamental cognitive abilities. While the oft-quoted statistic that our attention spans are now shorter than that of goldfish remains at best contentious and at worst dubious, the decline in critical thinking abilities is harder to ignore. The World Economic Forum reports that analytical thinking is the most sought-after skill by companies worldwide[5]; and yet a 2022 study conducted by the OECD[6] revealed that out of 120,000 university student participants, half performed at the two lowest levels of critical thinking, and the increase in critical thinking ability from entry to exit from higher education was smaller than expected. An economy where attention is more important than content condemns the collective muscle for deep thought to inevitable atrophy.

Another salient statistic that speaks to this growing phenomenon is reading habits. In 2021, the Australia Reads National Reading Survey found that 75% of Australians had read at least one book in the past year,[7] while a similar survey conducted by Macquarie University in 2017 had that number at 92%.[8] Unsurprisingly, survey respondents often cite distraction and inability to focus as key reasons for not reading more, as exemplified by a 2025 report by the Monash Sustainable Development Institute.[9] And this is not confined to Australia only. A multi-generational study on adolescents' media use in the US was conducted by researchers at San Diego State University and the results, which were published in 2018, reveal that the percentage of 12th graders who read a book or magazine every day was once 60% in the 1970s but had declined to just 16% by 2016.[10] The factors influencing reading habits are no doubt complex; but the trends just outlined correlate with increased adoption of digital technologies and social media; and the continued expansion of the attention economy is likely to only enlarge the volume of short-form content consumed at the expense of longer-form, more substantive material, such as books, that encourage deeper thinking. These trends, combined with the rise of artificial intelligence, potentially signal a decline in the efficacy of human capital to meet the demands of future jobs. And without the ability to analyse and solve problems, innovation and technological development—key drivers of economic growth—are likely to flounder.

**Are we powerless?**

Unfortunately, the decline in critical thinking and increased distraction are not the most egregious possibilities at play. A 2022 report published by the United Nations[4] on the rise of attention economies notes that the large-scale collection of user data and the use of social media algorithms are some of the "greatest perils" we face. And the reason is not ethical or political, but psychological. The report observes that such users of the digital world are "unaware of the algorithms working in the background that increasingly disempower them to act in their own best interest." A culture increasingly immersed in the pull of the attention economy, therefore, finds itself powerless to even recognise that it is in the clutches, and at the mercy, of attention seeking forces.

And there is evidence to suggest such immersion is indeed occurring—the prevalence of social media addiction, especially amongst the younger population, is well-known. The end result is a loss of individual autonomy, our very ability to think shaped not by individuality but by the invisible hand of those who control our attention. And if we are unable to reason as autonomous beings, are we truly the rational economic agents we assume ourselves, perhaps comfortingly, to be? It's one thing to lose the ability to understand nuance, to engage deeply with issues, to separate truth from fiction. But to lose the ability to understand what is in our own self-interest, and therefore act on that understanding—that shakes the very foundations of economic rationality.

**Conclusion**

The effect of the attention economy on our thinking patterns is certainly complex. What is clear, however, is that it very much has the potential to blunt our capacities for critical, deep, and attentive thinking in an increasingly fast-paced digital world of shallow, bite-sized snippets. In such a reality, it is up to us to recognise the invasive nature of attention economics, switch off from distractions, and continue to exercise the collective cognitive muscle productively.

[5]World Economic Forum. (2023). Future of jobs report 2023 (p. 38). World Economic Forum.
[6]Van Damme, D., & Zahner, D. (Eds.). (2022). Does Higher Education Teach Students to Think Critically? (p. 259). OECD Publishing. https://doi.org/10.1787/cc9fa6aa-en
[7]Australia Reads (2021). *National Reading Survey 2021 Survey Report*.
[8]Australian Research Council, & Macquarie University.(2016). READING THE READER: A SURVEY OF AUSTRALIAN READING HABITS (p. 6).
[9]Wright, B., Lennox, A., & Mata, F. (2025). *Understanding Australian readers Behavioural insights into recreational reading* (p. 6). Monash Sustainable Development Institute.
[10]Twenge, J. M., Martin, G. N., & Spitzberg, B. H. (2019). Trends in U.S. adolescents' media use, 1976–2016: The rise of digital media, the decline of TV, and the (near) demise of print. *Psychology of Popular Media Culture*, *8*(4), 329–345. https://doi.org/10.1037/ppm0000203

# Scarcity Beneath Our Feet: The Economic Significance of a Sand Shortage

**Toby White - Bachelor of Engineering (Honours) and Commerce**

*Fibre-optic cables. They're used in the walls of the buildings people live in and they're used in the glass in your devices that you could be reading this article on. These materials, as well as countless others that are intrinsic to modern society, are all possible to produce thanks to one non-renewable resource: sand.*

In our everyday lives, grains of sand are almost used as a unit of measurement for incomprehensible quantities. Comparable to the number of stars in the observable universe, you'd be forgiven for thinking the world's supply was not only in abundance, but that it was almost infinite. However, this assumption couldn't be further from the truth. In reality, millions of cubic metres are being imported to desert nations, beaches are being destroyed for their seemingly abundant resources, and the prices of products using sand as a raw material are skyrocketing. But what is the cause of the shortage and how significant could the economic damage be over the coming decades?

**How is it possible to be running out?**

In short, the rate at which society is consuming sand is increasing exponentially. Concrete production, of which sand is a major component, has increased dramatically since the beginning of the century. Urbanisation, infrastructure expansion and the increased preference of concrete for its structural properties have all contributed to the 100% increase in the global use of concrete since 2000.[1] Construction isn't the only sector heavily reliant on sand supply, with the technological industry utilising the material for component manufacturing. Fibre-optic cables transmit information across oceans, allow for touch screen devices and perhaps most critically, are essential in the production of silicon micro-chips. Despite the best efforts of the innovation departments of major tech companies, a reliance on silicon processors cannot be substituted.

> **"No clear replacement exists."** (Infinita Lab, 2024)[2]

The consumption of personal devices and the incorporation of planned obsolescence into their design further drives up the demand for sand and silicon at a rate that shows no sign of slowing down. According to the Semiconductor Industry Association, microchip sales increased by 19.1% compared to the previous year, with projections suggesting sales will increase by a further 60%[3] before 2030.[4] As supply chain costs have increased the price of delivery, labour costs to extract sand have also increased in price, both of which are passed onto the consumer. However, the main cause of the price rise is simple: The world doesn't actually have as much sand as you would expect. This is where it is important that not all sand is created equal. Even with the Sahara desert covering an area larger than the continental United States in sand, due to the composition of the grains it is onsidered unusable for almost all purposes. Instead, a coarser (and less abundant) makeup is needed, which is found in lakes and riverbeds across the world. [5]

**What are the problems of running out?**

As any good economics student would be able to tell you, the exploding

[1]Cement Concrete & Aggregates Australia. (2020). Guide to concrete construction — Part X: Environmental considerations (Version 1.0). Cement Concrete & Aggregates Australia.
[2]Infinita Lab. (2024, February 29). Beyond silicon — What is the next big thing after silicon chips? Medium. https://infinitalab.medium.com/beyond-silicon-what-is-the-next-big-thing-after-silicon-chips-bceb7dfa0f95
[3]Semiconductor Industry Association. (2025, February 7). Global semiconductor sales increase 19.1% in 2024; double-digit growth projected in 2025. Semiconductor Industry Association. https://www.semiconductors.org/global-semiconductor-sales-increase-19-1-in-2024-double-digit-growth-projected-in-2025/
[4]Burkacky, O., Dragon, J., & Lehmann, N. (2022, April 1). The semiconductor decade: A trillion-dollar industry. McKinsey & Company. https://www.mckinsey.com/industries/semiconductors/our-insights/the-semiconductor-decade-a-trillion-dollar-industry
[5]Beiser, V. (2019, November 18). Why the world is running out of sand. BBC Future. https://www.bbc.com/future/article/20191108-why-the-world-is-running-out-of-sand

demand in both construction and technological sectors has resulted in drastic increases in the price of sand globally. Australian sand prices have demonstrated this, with prices almost doubling in recent years due to a surge in mining and construction activity.[6]

While the increased scarcity increases costs for the manufacturers, the biggest victim of the short supply of sand is the consumer. According to price theory, the cost of production increase will ultimately be borne by the consumer, increasing the purchase price of these goods that are required to function in modern society. Mobile phones are, despite what my grandparents might claim, all but essential to modern life. Communication, navigation, information and safety are all provided by the silicon utilising machine that is annoyingly buzzing away on my desk as I'm writing this article.

The price of one of these phones has increased by over 500% since 2010. This can be attributed to many reasons, but the scarcity of the silicon based micro-chips their electrical systems run on stands out as the primary cause. The sharp increase of such a necessary item cannot be sustained for the consumer, given the rising cost of living in all other aspects of life in modern society.

**What can be done?**

The alarming aspect of this shortage is its apparent inevitability. The world is only going to depend more on technology in the coming years, with the increase in popularity of work from home arrangements and the increased usage of AI. The logical question then must be asked: What is the solution? Much to my mother's dismay, we cannot get rid of mobile phones and 'go back to the good old days'. On the contrary, it seems the only solution is progression, and with-it innovation. The belief in the free market suggests that the rising cost of silicon will incentivise the production of an alternative, something which is already happening in tech hubs like Silicon Valley. Gallium nitride and graphene chips are being constantly improved, with the diminishing price differential increasing the attractiveness of these alternative products.

**Conclusion**

Overall, the most difficult yet perhaps most important shift that must occur is in the mindset of society. The reliance on technologies directly causes shortages in raw materials, and our dependence on constant demand growth cannot be sustained indefinitely.

**Perhaps a combination of change, both in material and in mindset, will be the solution to the dwindling sand supply across the globe.**

[6]Murphy, R., & Hargreaves, G. (2022, November 20). Sand prices in West Australia surge as demand outstrips supply. ABC News. https://www.abc.net.au/news/2022-11-21/sand-prices-in-south-west-source-as-demand-increases/101629114

# Winning the AI Race: Why macro policy and regulatory architecture must work in tandem

**Emily Chuah, Analyst at Mandala Partners**

*As nations compete to capture AI-driven productivity gains, success depends as much on foundational policy settings as it does on headline investment announcements. Countries must expand savings supply, compete for global capital, ensure financial market flexibility, and prioritise workforce mobility to translate AI adoption into sustained economic growth. Success also depends on regulatory frameworks that attract digital platforms and foster innovation, and countries that optimise both dimensions will reap the largest economic benefits.*

If there was any doubt that we're in an artificial intelligence (AI) race, recent developments around the world removed it. Rising global competition is evident in the explosion of AI performance measurement, with benchmarks like MMMU, GPQA, and independent analytics tracking which models (and the countries in which they were developed) perform best.[1] For Australia, the stakes are clear: if we create optimal conditions for AI adoption, we can capture disproportionate productivity gains.

Most discussions, however, overlook the fact that winning the AI race is not simply about investment scale or technological breakthroughs. Rather, it is a competition in regulatory architecture and economic policy design, about how countries can maximise the potential productivity gains from the AI boom. This article will examine how regulatory frameworks and macroeconomic policy settings determine which countries will capture the largest AI productivity gains, with examples from the US, EU, and China.

Published in East Asia Forum, Singh and Triggs (2025) identify four key lessons for policymakers in Asia and around the world if they want to get the most out of the AI boom.[2]

1. Expanding savings supply to match investment demand
2. Offering higher returns to compete for scarce global capital
3. Ensuring financial markets maintain flexibility and direct capital optimally
4. Enabling workforce mobility and upskilling

**1. Expanding savings supply to match investment demand**

The AI boom will drive a major increase in investment, along with a surge in demand for savings to finance that investment. This creates a potential problem: if the demand for savings outstrips the supply of savings, interest rates rise, dampening the investment boom and offsetting some of the benefits to the community.

Countries with access to more savings will outperform those that do not. The policy implications are clear but sometimes counterintuitive. Governments should reduce debt and deficits, finding more efficient ways to deliver services – something which AI itself can help with. This frees up private savings for productive investment rather than financing government debt.

Domestic savings are unlikely to be sufficient, particularly for capital importing countries like Australia. Policymakers must remove restrictions

[1] See MMMU (2024), GPQA (2023), and Artificial Analysis (2025) for more information on AI performance and benchmarking.
[2] East Asia Forum (2025) Getting macro-ready for the AI race.

on foreign investment to compete for this global capital. The political temptation to protect domestic industries from foreign capital is strong but economically misguided, particularly during an investment boom. Capital inflows fund growth that benefits domestic workers and consumers and blocking them means forgoing productivity gains.

Perhaps counterintuitively, countries should get comfortable running trade deficits since exports will fall as the exchange rate appreciates with capital inflows. A trade deficit accompanying foreign investment is not a sign of economic weakness, rather it reflects success in attracting global capital to finance productive opportunities that generate returns exceeding its cost of capital.

**2. Offering higher returns to compete for scarce global capital**

Countries will need to compete for the world's savings as capital flows to jurisdictions offering the highest risk-adjusted returns. Countries with a higher return on capital unsurprisingly do better at attracting savings to finance the AI boom and hence reap more of its benefits.

This has two major policy implications. First, the marginal product of capital can be increased through better infrastructure (including data centres), more efficient services, and reduced regulatory burden. Each dollar invested generates more output, making the jurisdiction more attractive to investors. Second, tax reform becomes critical. Simplifying and reducing taxes on capital and investment will also increase the return on capital, encouraging more savings to flow into the economy and delivering bigger benefits from the AI boom.

Related reforms also matter. Better energy markets can lower input costs for AI infrastructure, which is generally energy-intensive. Improved resource management brings time and costs savings by accelerating project timelines and avoiding duplicated work for approvals across different government levels. These changes compound to make jurisdictions more attractive destinations for the global capital that will finance the AI boom.

**3. Ensuring financial markets maintain flexibility and direct capital optimally**

Financial markets will need to direct capital to where it is needed, and flexibility is key. Countries with more financial rigidities experience the same negative consequences as countries with insufficient savings: the investment boom is muted, and productivity gains are not as large.

For policymakers, this means making sure that financial regulations are not unnecessarily preventing firms and households from getting the capital they need. Bank asset risk weightings, along with regulations on pension funds and fintech, should all be reviewed with this objective in mind. The goal is not to eliminate prudential oversight, but to ensure regulations achieve their intended purposes without constraining productive investment.

Countries should think strategically about where they can most succeed in the AI technology stack. For example, Australia has competitive advantages in applications (e.g. domain expertise in mining, agriculture, and financial services) and infrastructure (e.g. data centre capacity and renewable energy potential).[3] Australia also has high-quality datasets from the public sector and research institutions. Being strategic and targeted about where countries can most succeed in the AI ecosystem will prevent resources from being spread too thin across disadvantageous areas.

**4. Enabling workforce mobility and accelerating upskilling**

Booming industries will need workers and many new AI businesses will be created by workers who leave their current jobs. In that context, policymakers should ensure that workers can switch jobs easily and upskill accordingly, and that entrepreneurs can start new businesses.

The first step would be removing barriers to job switching and mobility across the workforce. Non-compete clauses should be scrapped as they have been proven to suppress wage growth, reduce innovation diffusion, and prevent talent from flowing to highest value uses[4]. For the same reasons, taxes that punish relocation should be phased out.

Upskilling the workforce is also a key factor. The AI boom creates new jobs and higher wages, particularly in STEM fields, which will encourage more people to study and pursue careers in those areas. But the lag-time in this upskilling means that it is crucial to get ahead of the curve and use direct subsidies to start upskilling quickly in STEM capabilities. Market signals alone will not drive training fast enough to meet demand, and policy intervention can compress these adjustment lags.

While politically contentious, developed economies need to increase skilled migration, not reduce it. If businesses cannot expand due to a lack of skilled workers, regardless of whether those skills are domestically or internationally sourced, the economy will not get the full benefits of the AI boom. Countries that restrict skilled migration during technology-driven

[3]CSIRO (2024) Australia's circular economy comparative and competitive advantages.
[4]e61 Institute (2024) Non-compete clauses, job mobility and wages in Australia.
[5]See Jobs and Skills Australia (2024) Occupation shortages analysis for more examples.
[6]Grattan Institute (2022) Australia's migration opportunity: how rethinking skilled migration can solve some of our biggest problems.

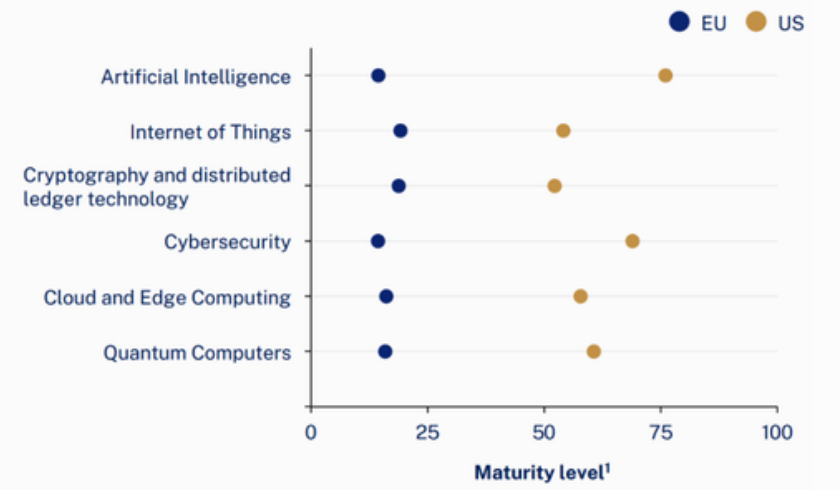


Exhibit 1: EU and US sector maturity in advanced digital technologies (2019-2022).[7]

*Note 1: Maturity level in the X-axis (referred to as the Relatedness Density Index)[8] indicates how easily a country can build comparative advantage in a particular technology.*

transitions will therefore capture only a fraction of potential productivity gains.[5,6]

**Regulatory foundations: the United States vs European Union**

Alongside macroeconomic policy, regulation plays a fundamental role in fostering innovation and technology adoption. International markets are fragmenting in their approaches to digital platform regulation, with varying consequences for innovation and productivity.

An example of this is the live debate on the best approach to regulate digital platforms to avoid abuse of market power. Digital platforms connect suppliers with buyers, creating valuable marketplaces that facilitate transactions and reduce search costs. However, policymakers are increasingly debating whether this gives rise to market power concerns.

Countries like the United States and Taiwan favour ex-post regulatory enforcement tools, addressing anti-competitive behaviour after it occurs. The European Union, Japan and the United Kingdom have implemented ex-ante regulatory regimes that impose obligations on digital platforms before any competitive harm materialises.

Many other jurisdictions are taking a 'wait and see' approach, observing these natural experiments before committing.

Getting the regulatory approach right is important because it could affect economic and technological development. Exhibit 1 illustrates how the US has outpaced the EU in technological maturity across many advanced technologies, including AI, at a time when digital technologies have become critical productivity drivers.

The divergence between countries matters because different regulatory architectures yield different economic outcomes. Lighter-touch frameworks appear to be encouraging stronger adoption of digital technologies by small and medium-sized businesses (SMBs), which are large drivers of productivity growth.[9] When SMBs can access online marketplaces without excessive regulatory friction, they generate higher revenue, deliver better quality goods and services, and create conditions that stimulate new business formation and entrepreneurship. The lesson here is that regulatory choices set the stage for whether AI-driven productivity gains can materialise, making them a large determinant of whether a country thrives in the AI race.

**In summary**

Winning the AI race depends on aligning macroeconomic policy settings and regulatory architecture to create the conditions required for maximum productivity gains. The countries that capture the largest benefits will be those that recognise AI success does not depend solely on technology strategy. The invisible hand will guide global capital, talent, and technology flows towards nations that get their policy settings right in the AI era.

[7] Mandala Partners (2025) Digital platforms and competition in Australia.
[8] Draghi (2024) The Draghi report: A competitiveness strategy for Europe (Part A).
[9] Australian Institute of Company Directors (2025) Benefits of boosting SME productivity.


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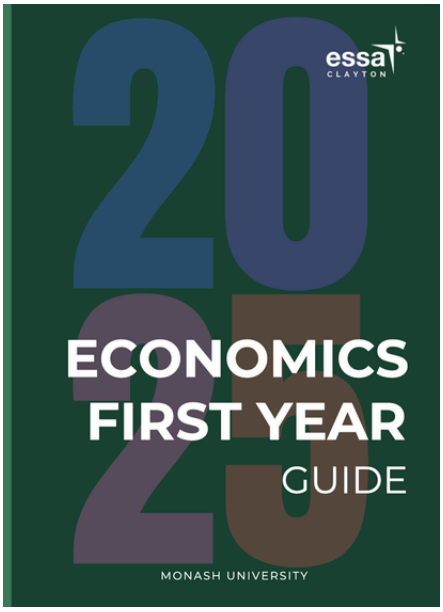
# 2025 Publications Spotlight




## 2025 Economics First Year Guide

This resource provides undergraduate students with a clear introduction to academic requirements and university life. It explains prerequisite units and progression streams to support effective planning of degree pathways. The guide also offers practical advice on navigating the Monash experience and highlights opportunities for engagement beyond the classroom. Unit reviews provide insight into expectations and challenges, helping students make informed choices. This resource equips students with knowledge and confidence to begin their economics studies successfully.

## Weekly Articles

Discover the world of economics with ESSA, your go-to source for insightful weekly articles on a broad range of topics. From the lastest in Australian policy to the impacts of deglobalisation and the cost-of-living crisis, our student analyses and up-to-date discussions keep you informed and ahead of the curve. Visit our website **economicstudents.com** to stay connected with the pulse of the economy.



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***Are you professionally attuned and passionate about economics discussions? Want to write insightful articles in our annual magazine and website or collaborate with other like-minded students on our podcast?***

**Indicative committment 3-4 hours/week**
**Duration: Full year**
**Key Characteristics:**

- Genuine interest in economics and current affairs
- MUST BE able to dedicate 3-4 hours/week to the portfolio
- Strong commitment to ESSA's objectives, culture and values
- Efficient time management, communication and organisation skills
- Independent research ability with a genuine interest in economics
- Committed to the growth of the publications portfolio

**Key Responsibilities:**

*Under the Writing Branch*

- Contribute original and insightful articles to be published on our website, as well as our annual publication Short Supply

*Edit and mentor affliated writers*

- Attend fortnightly publication meetings

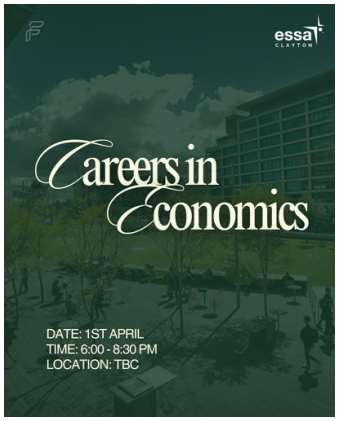
*Under the Podcasting Branch*

- Oversee major projects including the ESSA Exchange podcast
- Interview sponsors and industry professionals for insightful discussions
- Attend fortnightly publications meetings

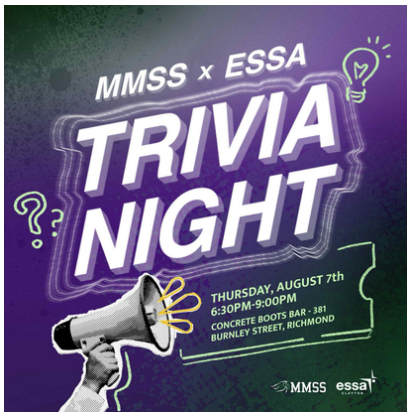
***Keep an eye out for recruitment notices near end of year via our social media!***

# 2025 ESSA Events











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