

# AI and Income Distribution: Inequalities and Opportunities

Charlotte Lee, St. Paul's Convent School

## **Abstract**

Artificial intelligence started as a fictional concept but has continuously developed into more and more sophisticated systems that are capable of automating large portions of production processes, as well as completing repetitive tasks. At first glance, it has displaced low to middle-class workers from employment, while those who hold the reins of AI have gained significant economic benefits. Yet this may not always be the case. It is hence questioned whether the continuous evolution of AI tends to shift the Gini coefficient closer to 0 or to 1. This paper aims to adopt a far-sighted approach in the evaluation of this subject matter, first by discussing relevant historical context, then by delving into the impacts of AI on the income levels of varied socioeconomic groups. Finally, there will be a pragmatic solution on how workers can adapt to these new challenges, in alignment with economic concepts.

## **Historical context**

History shows that the skills required by a sector or market are always changing for the better. Take agriculture as an example. Early humans lived a nomadic lifestyle (*The Development of Agriculture*, n.d.) which meant the ability to adapt to new environments was essential. Under the feudal system of mediaeval Europe, it was the ability to sustain oneself: division of labour was absent as each serf produced their own food (Encyclopaedia Britannica, 2024). In modern times, specialised skills are crucial since farmers specialise in one crop under a system of monoculture (Petruzzello, 2023). These three key stages demonstrate the continuous evolution of production stages within a sector. During the transition to each new agricultural stage, there would have been risks similar to what AI is estimated to bring: elimination of individuals who could not adapt to the new lifestyle.

Farmers would have experienced initial setbacks, but such transformations resulted in greater productivity and even maximum yield for some crops, which has raised the living standards of the lower classes. If crop yield represented income levels, the poor would have started earning more to bridge the gap with the wealthy.

Another important result of the Agricultural Revolution was the creation of jobs. Rise of private markets spurred a growth in numbers of merchants and traders that were accessible to people without formal education (McLean, n.d.). Today, the use of AI in agriculture has led to upskilling programmes for farmers from agriculture consultants and contract workers specialising in genetics, GIS, mechatronics and farm management (Lane & Saint-Martin, 2021). In the long run, major changes prove to benefit low-income groups by creating opportunities for higher income and occupational mobility.

### **AI on income levels**

Emergence of AI technologies are particularly a threat to the middle class. Sectors such as customer service, retail and clerical services are particularly prone to the third type of AI takeover (Shafiabady, 2023). The repetitive nature of their systems makes it easier for AI to learn, replicate and replace it. For example, current online chatbots can recognise customers' queries and instantly generate a detailed response. One AI system can reply to several customers at once, saving the company the labour costs which would have otherwise been spent on employing several staff members to sit at the virtual help desk all day. The gradual disappearance of middle-class jobs results in job polarisation, exacerbating the gap between high and low-income earners.

High-income countries have more human and financial resources to invest in artificial intelligence. A study was performed to measure the benefits of AI tools in customer support

(Brynjolfsson et al., 2023). It showed a 14% increase in the number of issues resolved and 34% improvement among inexperienced low-skilled workers. It can be inferred that low-skilled workers in more developed countries can hone their skills more effectively than those in low-income countries, go on to earn higher salaries and reduce absolute poverty, reducing the gap between high-income and low-income earners.

In contrast, developing countries are at a lower risk of AI takeover because they lack the necessary skills to utilise new technologies (*AI Will Transform the Global Economy. Let's Make Sure It Benefits Humanity.*, 2024). Despite a less mature AI system, job displacements are statistically more likely to occur than in developed countries (Shafiabady, 2023). The reason is that the labour market itself can be volatile. The concentration of workers in developing countries is five times higher than industrially developed countries (Ghose et al., n.d.). This means the supply of labour in developing countries is disproportionately greater than the demand for it, which increases competition for jobs. The concern is no longer about artificial intelligence replacing workers, but other workers replacing them. If the rise of artificial intelligence is as detrimental as people say, then it becomes interesting why job prospects are still more optimistic in developed countries with AI than in developing countries without AI. This seems to suggest that the development of artificial intelligence is a secondary factor of job displacements and income inequality.

Disadvantaged groups in face of AI evolution are ethnic minorities and individuals with low digital literacy. ChatGPT, a virtual assistant based in America, is well-trained in dominant languages such as Spanish, French, German (Quillen, 2023). In that sense, users may notice lower proficiency in Asian languages, where a prompt written in Malay returns a response in Indonesian (Nomoto, 2023). This causes the AI software to be less accessible for speakers of non-dominant languages. As for people with low levels of digital literacy, AI software becomes an inaccessible concept and they struggle to keep up with changes in

society. Marginalised groups become less competitive than people in the same industry who are familiar with artificial intelligence, increasing levels of unemployment.

Tech companies enjoy an unfair advantage in the continuous boom of AI (Farahani & Ghasemi, 2024, p.2). Labour costs saved from automation could be enjoyed as higher profits or be invested in more efficient AI services leading to more unlevel playing fields. Increased demand for AI services generates more revenue and higher profits. Black boxes (p.8) prevent biases in the AI system from being shed light on. Many jobs, especially the technical realm, were dominated by males; as a result, Amazon's recruitment algorithm learnt to make judgements against female applicants (*4 Shocking AI Bias Examples | Prolific*, 2023). Lack of transparency could spiral into exploitation of marginalised groups that further concentrates AI-related wealth on the hands of conglomerates. The upper limit of wealth is raised, *ceteris paribus*, widening the gap between the rich and the poor.

A quantitative study could be performed to discover the effects of AI on income inequality. First, identify business sectors that have adopted AI technology. Next, collect data on income levels of varied socioeconomic groups before and after the implementation of AI, as well as statistics on employment rates (number of employed individuals over the total labour force registered with the government). Then, categorise sectors along a scale of 1 to 5 the extent to which AI has taken over the production process. Placing employment rates and income levels on the same axis, plot a graph to show their correlation with the degree of automation.

### **Evolution of AI as an Opportunity to All Workers**

As production processes are increasingly automated, demand shifts from workers with practical skills to people who have strong independent thinking skills (Farahani & Ghasemi,

2024, p.5). Although AI is powerful in mathematical thinking, external guidance remains essential to ensure appropriate implementation. Critical thinking is required to notice and remove flaws from existing AI systems, to check for statistical errors in big data and to ensure the factual accuracy of generative AI. Even though AI excels in mathematical decision-making, humans are the ones to decide whether its decisions go by ethical standards, and to make adjustments accordingly. Jobs stressing on emotional intelligence are thus much less likely to be replaced by AI. Current technology has yet to completely imitate a human's creative thinking, making innovation another valuable skill (*AI Is a Powerful Tool, but It's Not a Replacement for Human Creativity*, 2023).

In order to increase their competitiveness against AI technology, low-skilled workers should aim not only to improve their skill, but to broaden it through life-long learning. The more skills a worker specialises in, the higher their occupational mobility and the less vulnerable they are to AI takeover. Companies are highly encouraged to provide reskilling and upskilling programmes to enhance the quality of their human capital. On account of a firm's spare capital, re-training should last 1-2 years and equip employees with a decent level of digital literacy, the skills to utilise artificial intelligence, and most importantly harness "unique human skills" of empathy, creativity and critical thinking (Farahani & Ghasemi, 2024, p.5). This is so they remain in employment as crucial human oversight in the case of "extreme situations" such as unforeseeable technical malfunction (Ernst et al., 2019). It also enables employees to transition to higher-paying positions, bridging the gap between low and high-income earners. This would eliminate the pessimistic cases where workers view artificial intelligence as a rival, which would lead to ineffective allocation of resources, or cases where workers are replaced by AI, which would result in a shrunken productive capacity as unemployment rises. In the long run, re-training is more effective than universal

basic income because there is an incentive to learn hard and work hard, whether simply for work stability or a better pay.

## Conclusion

The rapid development of artificial intelligence parallels the Agricultural Revolution, when innovations disrupted traditional farming but boosted outputs. In the immediate term AI displaces low-skilled jobs and favours high-skilled workers, also known as job polarisation. In the long run, however, AI evolution serves as a leading incentive for workers to improve their skill set. Society should take the initiative to exploit the long-term advantages of AI, rather than try to avoid its short-term downsides. Reskilling and upskilling programmes will prepare less privileged groups with the necessary skills to contribute to an increasingly automated workplace, reducing income inequality.

## References

1. Meredith, S. (2024, January 15). *IMF warns AI to hit almost 40% of jobs worldwide and worsen overall inequality*. CNBC. <https://www.cnbc.com/2024/01/15/imf-warns-ai-to-hit-almost-40percent-of-global-employment-worsen-inequality.html>
2. *AI will transform the global economy. let's make sure it benefits humanity*. (2024, January 14). IMF. <https://www.imf.org/en/Blogs/Articles/2024/01/14/ai-will-transform-the-global-economy-lets-make-sure-it-benefits-humanity>
3. Shafiabady, N. (2023, November 2). *Whose job will AI replace? Here's why a clerk in Ethiopia has more to fear than one in California*. The Conversation. <https://theconversation.com/whose-job-will-ai-replace-heres-why-a-clerk-in-ethiopia-has-more-to-fear-than-one-in-california-216735>

4. Lindy. (n.d.). *Examples of how you can use AI to power customer service in your business* <https://www.lindy.ai/blog/examples-of-how-you-can-use-ai-to-power-customer-service-in-your-business>
5. Ghose, A. K., Majid, N., & Ernst, C. (n.d.). *Global Employment Challenge summary Ajit revised*. ILO. Retrieved August 30, 2024, from [https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@dgreports/@dcomm/@publ/documents/article/wcms\\_092210.pdf](https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@dgreports/@dcomm/@publ/documents/article/wcms_092210.pdf)
6. *Generative AI likely to augment rather than destroy jobs*. (2024, February 2). International Labour Organization. <https://www.ilo.org/resource/news/generative-ai-likely-augment-rather-destroy-jobs>
7. Farahani & Ghasemi (2024, February 21). *Artificial Intelligence and Inequality: Challenges and Opportunities*
8. The Editors of Encyclopaedia Britannica. (2024, July 18). *Serfdom | History & Examples*. Encyclopedia Britannica. <https://www.britannica.com/topic/serfdom>
9. Nomoto, H. (2023, November). *Issues surrounding the use of ChatGPT in similar languages: The case of Malay and Indonesian*. In *Proceedings of the 13th International Joint Conference on Natural Language Processing and the 3rd Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics (Volume 2: Short Papers)* (pp. 76-82).
10. *4 shocking AI bias examples | Prolific*. (n.d.). Prolific. <https://www.prolific.com/resources/shocking-ai-bias>
11. McLean, J. (n.d.). *Effects of the Agricultural Revolution | History of Western Civilization II*. <https://courses.lumenlearning.com/suny-hccc-worldhistory2/chapter/effects-of-the-agricultural-revolution/>

12. Petruzzello, M. (2023, November 14). *Monoculture | Definition, Farming, Advantages, Disadvantages, Examples, & Facts*. Encyclopedia Britannica.  
<https://www.britannica.com/topic/monoculture>
13. *The development of agriculture*. (n.d.).  
<https://education.nationalgeographic.org/resource/development-agriculture/>
14. Quillen, S. (2023, May 2). How many languages does ChatGPT speak? - Sam Quillen - medium. *Medium*. <https://siquillen.medium.com/how-many-languages-does-chatgpt-speak-bf5cfc35a586>
15. Lane, M. and A. Saint-Martin (2021), "The impact of Artificial Intelligence on the labour market: What do we know so far?", *OECD Social, Employment and Migration Working Papers*, No. 256, OECD Publishing, Paris,  
<https://doi.org/10.1787/7c895724-en>.
16. Ernst, E., Merola, R., & Samaan, D. (2019). Economics of Artificial Intelligence: Implications for the future of work. *IZA Journal of Labor Policy*, 9(1).  
<https://doi.org/10.2478/izajolp-2019-0004>
17. *AI is a powerful tool, but it's not a replacement for human creativity*. (2023, December 25). World Economic Forum.  
<https://www.weforum.org/agenda/2023/06/ai-cannot-replace-human-creativity/>
18. Brynjolfsson, E., Li, D., & Raymond, L. (2023). *Generative AI at work*.  
<https://doi.org/10.3386/w31161>