

# **The Impact of AI on Economic Growth and Inequality**

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## **Abstract**

The paper explores whether Artificial Intelligence (AI) exacerbates income inequality. It examines the impact of AI on economic disparities, especially between small business and large companies, and discusses how it can contribute to the displacement of workers. The study also utilizes historical instances to understand the parallels between past technological disruptions and the current AI revolution. Additionally, a research setting is designed to substantiate the analysis. To mitigate income inequality, this paper proposes improving the average educational level as a potential solution.

## **Introduction**

Artificial Intelligence (AI) is the theory and development of computer systems capable of performing tasks that historically required human intelligence, such as recognizing speech, making decisions, and identifying patterns (Coursera, 2024). As AI becomes increasingly integrated into our lives, it changes how people live and work. The Pew Research Center (2022) surveyed 11,004 U.S. adults and found that “27% of Americans say they interact with AI at least several times a day, while another 28% think they interact with it about once a day or several times a week”.

As AI continues to evolve, it is not only just making things easier but also raises concerns about how it affects income distribution and how these benefits are shared across different groups of the people. This paper will explore how AI exacerbates income inequality by using current and historical examples, designing a research setting, and discussing the potential solution to address this issue.

## **Economic Inequality**

AI has a varied impact on different groups of people. On one hand, big tech companies like Microsoft, Apple, and Tesla dominate AI developments. Also, the performance gap between the large and small companies is significant. To be more specific, the difference in median return on operating assets was 15% in the 1990s, but has recently doubled to 30-35%; also, both the median return on operating assets and the median profit margin of the small companies turned negative during 2015-2017 (Govindarajan et al., 2019). This data shows that the large companies are getting more profitable, whereas the small ones suffer from chronic unprofitability.

On the other hand, AI can be a double-edged sword for workers. It has the potential to help workers increase productivity. Brynjolfsson, Li, and Raymond (2023) show that call

center operators became 14% more productive when they used the technology, with gains of over 30% for the least experienced workers. While this seems like a positive development, the broader impact will be more complicated. As AI gradually automates basic work, many workers will face displacement, all of which will lead to increased poverty, reduced social mobility, and increased socioeconomic inequality as more and more wealth is concentrated under the control of a limited number of firms and dominant players.

In addition, consumers are also affected by AI's rise. Under the influence of this pattern of market concentration, there is also a risk of higher prices and less innovation when a few firms or individuals control a larger share of the market, which negatively affects consumer choices and indirectly leads to a reduction in the opportunities for small and medium-sized enterprises (SMEs) to enter the market (Hu, 2023).

### **Historical Precedents**

Reflecting on historical records, certain disruptions due to technological progress were thought-provoking. The British industrial revolution revealed how the development of technology negatively affected the employment rate. Vipond (2022) suggests that approximately 30,000 female bootmakers experienced technological unemployment, while 110,000 male bootmakers experienced labor displacement. The most rapid decline in employment was driven by the innovation of binders and cordwainers. Moreover, the spread of machines in industrial production had the greatest impact on those skilled workers because capitalists could hire low-wage workers to operate the machines for production, and skilled workers on expensive commissions were at risk of losing their jobs. In the modern era, AI has gradually taken over a large number of job positions. Around 10% of U.S. jobs face a risk from AI disruption: IBM plans to cut 3,900 jobs in the marketing and communications division and stop hiring for roles that could be replaced by AI (Hetler, 2024).

## **Research Setting**

The research can be designed to better substantiate the argument by simulating a social welfare system within the firm. In this scenario, the firm is hiring a group of workers to produce 10,000 units of products. The profit is 10 units. However, if the firm decides to utilize AI to produce the same amounts of products instead, the firm can earn 13 for net profit. At this point in the simulation, the firm's management is asked whether they would be willing to replace their employees with AI. Given that individuals are rational and companies aim to maximize profits, management would likely replace employees. The extra profits from using AI go to the firm's owners and shareholders. However, the workers who are replaced by AI are facing unemployment. Therefore, it proves that AI will exacerbate income inequality.

## **The Composition of the Workforce**

From a labor market perspective, AI poses a more severe problem for the portion of the labor force that is under constant threat for low-skilled and uneducated workers. For every 1% increase in the size of robots, about 4.6% of jobs will be replaced and in the next 20 years, 76% of workers will be at risk of being replaced (Yue, 2023). Moreover, ChatGPT, a chatbot developed by OpenAI, has significant impacts. A study reveals that 32.8% of occupations could be fully impacted by ChatGPT and 36.5% might experience a partial impact (Zarifhonorvar, 2023).

This phenomenon might be mitigated by improving the average education level and therefore there will be more specialists and opportunities in the long term. According to Becker (1964)'s Human Capital Theory, investment in human capital in the form of education has paid a substantial rate of return. This study finds such investments have also been a major factor in raising the productivity of the American people. Following this theory, companies can invest in human capital by providing training to employees, therefore improving staff's educational level per capita.

A common way of investing in human capital is by reskilling or upskilling existing workers. For example, many technology companies offer training programs or tuition reimbursement to encourage existing employees to gain more valuable skills, providing access to an improved labor pool without the expense of recruitment. Moreover, as AI gradually fits into our daily lives, computer programming has become a popular approach for human capital investments, as the internet reduces the costs and difficulties of learning programming techniques remotely. As a result, issues such as structural unemployment, a longer-lasting form of unemployment caused by workers lacking requisite job skills currently, can be resolved on a large-scale.

## **Conclusion**

By summarizing and forecasting the economic conditions in the perspective of Economic Equality, Employment, and historical instances, Artificial Intelligence plays an indispensable role in global GDP growth and overall economic growth. However, AI also brings challenges, such as the increase of Economic Inequality, Unemployment rate, and severe competitions. The research setting also shows how AI will exacerbate these issues by replacing workers for the sake of higher profits. To mitigate these drawbacks, governments need to implement relevant and effective policies to regulate the market to ensure the benefits of AI are equally distributed to various groups of people. One effective way is to improve the average educational level and refine the workforce's skill sets by encouraging companies to provide employees with training programs and tuition reimbursement.

## References

- Agrawal, A., Gans, J., & Goldfarb, A. (2019, January). Economic policy for artificial intelligence. *Journal of Economic Perspectives*, 33(1), 25-42.
- Becker, Gary S. (Gary Stanley), 1930-2014. *Human Capital; a Theoretical and Empirical Analysis, with Special Reference to Education*. New York :National Bureau of Economic Research; distributed by Columbia University Press, 1964.
- Bondarenko, P. (2024, August 12). gross domestic product. *Encyclopedia Britannica*.  
<https://www.britannica.com/money/gross-domestic-product>
- Brown, A. (2021, September 10). Utilizing AI and big data to reduce costs and increase profits in departments across an organization. *Forbes*.  
<https://www.forbes.com/sites/anniebrown/2021/04/13/utilizing-ai-and-big-data-to-reduce-costs-and-increase-profits-in-departments-across-an-organization/>
- Brynjolfsson, E., & McAfee, A. (2014). *The Second Machine Age*. W.W. Norton & Company, Incorporated.
- Coursera (2024). *What is Artificial Intelligence? definition, uses, and types*. Coursera. (n.d.).  
<https://www.coursera.org/articles/what-is-artificial-intelligence>
- Govindarajan, V., Lev, B., Srivastava, A., & Enache, L. (2019, August 16). The gap between large and small companies is growing. Why? *Harvard Business Review*.  
<https://hbr.org/2019/08/the-gap-between-large-and-small-companies-is-growing-why>
- Harvard Business Review. (2023, March 15). 3 ways small businesses can use AI to drive growth. *Harvard Business Review*. <https://hbr.org/sponsored/2023/03/3-ways-small-businesses-can-use-ai-to-drive-growth>

Heaven, W. D. (2024, January 8). AI for everything: 10 breakthrough technologies 2024. MIT Technology Review.

<https://www.technologyreview.com/2024/01/08/1085096/artificial-intelligence-generative-ai-chatgpt-open-ai-breakthrough-technologies>

Hetler, A. (2024, August 2). Tech sector layoffs explained: What you need to know. WhatIs. <https://www.techtarget.com/whatis/feature/Tech-sector-layoffs-explained-What-you-need-to-know>

Hu, Q. (2023). Artificial intelligence: A discussion of impact on the social wealth. Semantic Scholar.

Lehrer, J. (2011, October 4). Why do some people learn faster? Wired.

<https://www.wired.com/2011/10/why-do-some-people-learn-faster-2/>

Microsoft. (2019, June 27). AI, GDP, and greenhouse gas. Microsoft On the Issues.

<https://news.microsoft.com/on-the-issues/2019/06/27/ai-gdp-greenhouse-gas/>

Pew Research Center. (2023, February 15). Public awareness of artificial intelligence in everyday activities. Pew Research Center.

<https://www.pewresearch.org/science/2023/02/15/public-awareness-of-artificial-intelligence-in-everyday-activities/>

Rotman, D. (2024, August 26). How to fine-tune AI for prosperity. MIT Technology Review.

<https://www.technologyreview.com/2024/08/20/1096733/how-to-fine-tune-ai-for-prosperity/>

van Delft, M. (2019). Explaining the relation between AI and GDP. Eindhoven University of Technology. <https://research.tue.nl/en/studentTheses/explaining-the-relation-between-ai-and-gdp>

Vipond, H. (2022, June 1). Technological Unemployment in Victorian Britain. Economic History. <https://blogs.lse.ac.uk/economichistory/2022/06/01/technological-unemployment-in-victorian-britain/>

Yue, Q. (2023, May 15). Study on the impact of artificial intelligence on employment and income inequality, based on technological determinism theory. Atlantis Press.

Zarifhonorvar, A. (2023, November 14). Economics of ChatGPT: A labor market view on the occupational impact of artificial intelligence. Journal of Economics, Business and Development.