Artificial Intelligence and Global Economic Inequality: Causes, Solutions, and Impacts

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A B S T R A C T

This study aims to analyze the relationship between the adoption of artificial intelligence and economic inequality, and to explore policy solutions that can reduce the negative impact of AI on economic inequality. The method used in this study is a literature study, by reviewing various relevant studies, reports, and articles on the impact of artificial intelligence on economic inequality. The results of the study indicate that artificial intelligence can worsen global economic inequality through two main mechanisms: first, through the replacement of low-skilled jobs by automation, which increases unemployment among low-skilled workers; second, through increasing dependence on technology that is only accessible to countries or groups with sufficient resources. On the other hand, AI also offers opportunities to reduce inequality, especially if used in sectors that can accelerate economic development in developing countries, such as agriculture and education. With the right policies, artificial intelligence can not only be a source of economic growth, but can also play a role in reducing socio-economic inequality.

1. Introduction

Artificial intelligence (AI) has become a key driver in the transformation of various economic sectors, including industry, healthcare, finance, and transportation. In the industrial context, AI enables the automation of processes that previously required human labor, potentially increasing efficiency and productivity [1,2,3]. However, the impact of AI applications is not limited to efficiency gains; the technology also introduces new challenges, particularly related to economic inequality. Developed countries with better technological infrastructure and greater access to AI tend to reap greater economic benefits than developing countries, which are often hampered by resource and technological constraints [4,5].

One of the main issues that has emerged is the concentration of wealth and power in the hands of a few large corporations and governments, which can exacerbate economic inequality. This is because large corporations that are able to invest in AI technologies can outcompete smaller competitors, creating inequality in access to economic opportunities [4,6]. Furthermore, the impact of AI on the labor market is also a concern, where automation can lead to job losses in certain sectors, which in turn can widen the gap between rich and poor countries [7].

Artificial intelligence (AI) not only has the potential to worsen inequality between countries, but it can also worsen economic inequality within countries. In many contexts, especially in countries with a strong industrial base, AI-driven automation has replaced many jobs previously performed by humans. This creates inequality in the distribution of jobs, with low-skill and routine jobs increasingly being replaced by machines and algorithms, while high-skill jobs are growing [8].

This phenomenon contributes to increasing inequality of income and opportunity between the working class and educated professionals. High-skilled jobs, such as in information technology, data analysis, and software engineering, are increasingly in demand and earn higher wages. Conversely, simpler and more routine jobs, such as in the manufacturing and service sectors, are experiencing a decline in demand, leading to reduced employment opportunities and incomes for low-skilled workers [9,10]. For example, a report by the McKinsey Global Institute suggests that automation could displace up to 800 million jobs worldwide by 2030, with a greater impact on low-skilled jobs [5,6]. This suggests that without appropriate policy interventions, the economic benefits of AI technology adoption are not always evenly distributed, which in turn could exacerbate social and economic inequalities within societies [5,6].

Understanding the dynamics between artificial intelligence (AI) and economic inequality is becoming increasingly urgent, especially given the rapid pace at which this technology is evolving. On the one hand, AI has the potential to be a tremendously empowering tool in solving a range of global problems. For example, AI can improve agricultural productivity in developing countries by optimising resource use and increasing crop yields [11]. In the healthcare sector, AI can provide more efficient services, such as faster and more accurate diagnosis, especially in remote, underserved areas [12,13]. On the other hand, however, inequalities in access to these technologies can exacerbate existing inequalities, creating a deeper divide between those with access to the technology and those without [14,15].

AI-driven automation is likely to displace low-skill jobs, while high-skill jobs are increasingly gaining ground. This could exacerbate the income and opportunity gap between the working class and educated professionals [16]. For example, generative AI can increase productivity and create new jobs, but its benefits are likely to be distributed unevenly, widening the gap between highly skilled and unskilled groups [17,18]. In addition, AI can also reinforce existing biases in the system, such as in the health context, where AI algorithms can exacerbate health disparities if not designed with equity and inclusion in mind [19].

To address these challenges, it is important to further explore how AI contributes to economic inequality and find solutions that enable the equitable use of AI. Public policies that support the retraining and upskilling of the workforce affected by automation are essential to ensure that all levels of society can benefit from these technological advances [11,15,16]. In addition, the development of an ethical framework for the application of AI is also needed to reduce bias and ensure that this technology is used to improve overall social and economic well-being [20,21]. This study aims to provide policy recommendations that can help utilize artificial intelligence in a more equitable and inclusive manner, reduce existing inequalities, and ensure that the benefits of AI can be enjoyed by all levels of society.

2. Literature Review

Economic inequality refers to conditions in which there is inequality in the distribution of

income, wealth, and economic opportunities between individuals or groups in society. In this context, classical economic theories, such as the theory of capitalism and the theory of income distribution, are often used to explain inequality that occurs due to structural factors, including access to education, labor markets, and technology [22]. As technology advances, especially artificial intelligence (AI), economic inequality can be exacerbated by new factors that emerge, requiring a deeper understanding of the interaction between technological innovation and economic inequality. According to endogenous economic theory, technological innovation, including AI, has the potential to increase productivity and efficiency. However, if not balanced with appropriate policies, this innovation can worsen existing inequalities. For example, AI can increase productivity in certain sectors, but it can also displace low-skilled jobs, creating inequality in the distribution of jobs and income [23,24]. Research shows that AI-driven automation tends to benefit high-skilled workers, while low-skilled workers are increasingly marginalized [25].

Furthermore, inequality in access to AI technologies is also a major concern. Countries and groups with limited access to these technologies are at risk of being left behind in the global economy. This creates a widening "digital divide," where those without access to modern technologies are increasingly isolated from economic opportunities [26,27]. In the context of education, AI can serve as a tool for empowerment, but if not implemented inclusively, it can exacerbate existing inequalities in the education system [28]. Previous research has shown that artificial intelligence (AI) has a significant impact on economic inequality; however, most of this research has focused on one dimension of inequality, either between countries or between sectors, without providing a more comprehensive analysis of how policies and interventions can mitigate these negative impacts. While many studies have shown the potential of AI to improve economic inequality, there has been little study of deeper policy solutions to reduce this inequality, especially policies involving developing countries and the informal sector [29].

In addition, previous studies have focused more on the impacts of AI in developed countries, while the specific impacts in developing countries, which have different economic characteristics, have not been widely explored. This creates a gap in understanding how AI can affect inequality in different contexts, especially in countries with weaker technological infrastructure and greater reliance on the informal sector [15]. Another gap lies in the limited number of studies that combine theories of economic inequality with direct analysis of the impacts of policies that can be implemented to equalize the distribution of AI benefits. Therefore, this study aims to fill this gap by examining the impacts of AI on global and domestic economic inequality in more depth, and identifying inclusive policies that can reduce inequality caused by AI adoption [30].

Furthermore, although there are several studies that discuss policies to address inequality generated by AI, many of them do not provide specific and practical recommendations for implementation in developing countries. For example, a study conducted by [31], highlights the importance of inclusive policies, but does not discuss in depth how such policies can be implemented in different contexts. In addition, research examining the impact of AI on inequality in the informal sector is still very limited, even though this sector is an important part of the economy in many developing countries [32].

3. Methodology

This research method uses literature study as the main approach to explore the impact of artificial intelligence (AI) on economic inequality. Data were collected from various relevant academic sources, including journal articles, books, and research reports, using keywords related

to AI, economic inequality, and automation. The source selection process was carried out based on the relevance of the topic and the credibility of the source, with a focus on research that discusses the relationship between AI and economic inequality, especially in developing countries [33,34]. Data analysis was carried out qualitatively descriptively by categorizing key findings, such as the impact of AI on the distribution of jobs, income, and economic policy. From this analysis, the main patterns that emerged were synthesized, as well as the identification of existing research gaps. Validation was carried out through source triangulation, by comparing research results from various trusted sources and ensuring the conformity of the findings with reports from leading international institutions [11].

4. Results and Discussion

From this research, it is expected to obtain several important findings regarding the relationship between artificial intelligence (AI) and global economic inequality. Some of the expected results include:

Causes of Economic Inequality Exacerbated by AI

This study is expected to identify various factors that exacerbate economic inequality due to the adoption of AI, both globally and domestically. One of the main findings expected is that countries with limited technological resources tend to have difficulty in optimally utilizing AI, leading to wider economic disparities. This is in line with findings that show that inequality in access to technology can worsen economic conditions in developing countries [17]. AI-driven automation has the potential to replace low-skilled jobs, creating greater income inequality [11]. The application of AI in healthcare can exacerbate inequality, especially if it does not take into account broader social factors [35]. Research by [36] also highlights the importance of addressing bias in AI models to ensure that this technology does not exacerbate existing inequalities, especially in the context of health. Thus, it is important to develop inclusive and sustainable policies to address the negative impacts of AI on economic inequality.

This research is also expected to shed light on the relationship between economic inequality exacerbated by AI and its impact on social trust. Previous findings suggest that rising income inequality can reduce people's trust in institutions and each other [37]. This can create a negative cycle where mistrust exacerbates inequality, which in turn can reduce support for policies aimed at reducing inequality. Policies that support education and retraining for workers affected by automation are essential to ensure that all individuals, regardless of their educational background or skills, have the opportunity to adapt to the changes brought about by AI [38]. Furthermore, it is important to develop an ethical framework for the application of AI to reduce bias and ensure that this technology is used to improve overall social and economic well-being [39].

Impact of AI on the Job Market and Income Distribution

Based on secondary data analysis and surveys, the study shows how automation and the replacement of human jobs with AI technology can affect the structure of the labor market in various countries. In many cases, jobs previously performed by human workers, especially in the manufacturing and service sectors, are replaced by robots or algorithms, creating structural unemployment and increasing income inequality between low-skilled and high-skilled workers. For example, the manufacturing sector that has adopted AI automation has seen a significant reduction in the number of jobs available to low-skilled workers. This is in line with findings that

automation can cause structural unemployment, where workers cannot easily switch to other jobs due to a lack of the necessary skills [40]. In this context, high-skilled workers tend to benefit from the productivity gains generated by AI, while low-skilled workers are increasingly marginalized [41].

As more jobs are replaced by technology, the incomes of low-skilled workers could potentially decline, while the incomes of skilled workers and technology professionals could increase significantly. This creates a wider gap between these groups, which in turn exacerbates income inequality in society [42]. Research by [43] shows that inequality in income distribution can be directly related to high unemployment rates among low-skilled workers, which is further exacerbated by automation.

Solutions and Policy Recommendations to Reduce Inequality

One of the key outcomes of this study is the mapping of solutions that can be implemented to reduce the negative impacts of AI on economic inequality. These include policies that support inclusiveness in technology access, skills training programs for workers affected by automation, and more equitable policy approaches to the distribution of economic benefits from AI. For example, policies that encourage the continued adoption of AI in high-risk economic sectors, such as agriculture or education, by involving collaboration between government, the private sector, and civil society.

Opportunities for Leveraging AI to Reduce Inequality

Artificial Intelligence (AI) offers significant opportunities to reduce economic inequality, especially in developing countries. When applied wisely, AI can improve access to education, optimize healthcare, increase agricultural productivity, and strengthen infrastructure, thereby addressing systemic inequalities. The potential for AI to democratize access to resources and services is particularly evident in sectors such as education and healthcare, where the technology can bridge gaps that have historically marginalized certain populations.

In education, AI-based platforms can provide personalized learning experiences tailored to individual student needs, improving educational outcomes for disadvantaged communities. For example, AI can facilitate adaptive learning systems that adjust content and pace based on student performance, which has been shown to increase engagement and retention in educational contexts [44]. Additionally, integrating AI into educational frameworks can help overcome geographic barriers, enabling students in remote areas to access high-quality educational resources [45]. This is especially important in developing countries where access to traditional educational institutions may be limited.

The health sector is also an area where AI can play a transformational role. AI technologies can improve the accuracy and efficiency of diagnosis, which is especially important in areas with limited health resources [46]. Additionally, developing AI systems that are sensitive to local contexts can ensure that health service delivery is equitable and meets the specific needs of diverse populations [35]. However, it is important to implement these technologies with a focus on inclusivity to avoid exacerbating existing inequalities, as expressed by concerns about algorithmic bias that can disadvantage marginalized groups [47]. Agriculture can also benefit significantly from AI applications. Precision agriculture technologies can optimize resource use, increase crop yields, and strengthen food security, which is especially important in developing countries where agriculture is a major source of livelihood [45]. AI can help farmers make data-driven decisions, thereby increasing productivity and economic stability. However, successful integration of AI in

agriculture requires appropriate policies and training to ensure that smallholder farmers can effectively utilize these technologies [48].

While the potential of AI is promising, there are inherent risks that can lead to increased inequalities if not managed properly. AI implementation must be accompanied by strong policies that promote equitable access and prevent the reinforcement of existing biases. For example, frameworks that encourage public and patient engagement in AI development can help ensure that the technology meets the needs of all stakeholders, especially those from disadvantaged backgrounds [49]. Additionally, creating a collaborative environment between policymakers, technologists, and community representatives is critical to creating inclusive AI systems that serve the broader population [35}.

5. Discussion

Artificial Intelligence (AI) has become a major driver of innovation and efficiency across sectors, but on the other hand, this technology also has the potential to exacerbate global economic inequality. Developing countries, which often have limited access to the technology and infrastructure needed to make the most of AI, are at risk of increasing economic inequality compared to developed countries [28]. Research explores how AI could exacerbate economic inequality. AI-driven automation has the potential to displace low-skilled jobs, which make up a large portion of the workforce in many developing countries. According to a study by the McKinsey Global Institute, up to 800 million jobs worldwide could be lost to automation by 2030, with the impact being greater in countries with lower levels of education and limited skills [45]. AI could also exacerbate income inequality by increasing productivity in certain sectors, but not all workers will benefit from these improvements. A study by Brynjolfsson and McAfee shows that while AI can increase corporate efficiency and profits, these gains are often not distributed evenly among workers [46].

On the other hand, AI also offers great opportunities to reduce inequality, especially in education, health, and agriculture, which can provide wider access for marginalized populations. AI can improve educational outcomes through personalized learning platforms, improve health services with more accurate diagnoses, and optimize precision agriculture to increase food security. However, the use of AI must be accompanied by policies that maintain inclusivity and prevent algorithmic bias that can exacerbate existing inequalities.

This study relies on secondary data and surveys that may not fully represent conditions on the ground, especially in developing countries with varying levels of technology adoption. Second, limitations in the scope of the study in time and space may affect a broader understanding of the long-term impacts of AI on economic inequality. Finally, although this study covers a wide range of sectors, not all sectors impacted by AI, such as finance or transportation, could be investigated in depth. Future research could focus on a more in-depth analysis of the impacts of AI in specific sectors, including finance and transportation, and how this technology can be applied equitably in countries with limited resources. Further research could explore more effective policies to address algorithmic bias and the social impacts of AI, as well as the potential for implementing this technology in local contexts that are more sensitive to the needs of marginalized communities. Research on the effectiveness of education and retraining policies for workers affected by automation should also be expanded to understand their long-term impacts on income and social inequality.

6. Conclusion

The study finds that artificial intelligence (AI) has the potential to exacerbate global economic inequality, especially in developing countries with limited access to technology. AI-driven automation risks creating structural unemployment and widening the income gap between low-skilled and high-skilled workers. However, AI also offers opportunities to reduce inequality, especially in education, health, and agriculture, by providing greater access to marginalized populations. Therefore, inclusive, equitable policies based on skills training and locally sensitive technology applications are needed to mitigate the negative impacts of AI and maximize its positive potential.

7. Recommendation

To reduce economic inequalities exacerbated by AI, inclusive technology access policies are needed, especially in developing countries. Reskilling and upskilling programs should be put in place for workers affected by automation, so that they can adapt to changing labor markets. In addition, developing ethical policies to prevent algorithmic bias is essential to ensure that AI is used for the greater social good. The use of AI in education, health, and agriculture should be encouraged to increase access and productivity, while reducing social disparities. Collaboration between governments, the private sector, and civil society is also essential to design inclusive policies. Finally, continuous monitoring and evaluation of the impact of AI will help adjust policies more effectively to reduce global economic inequality.

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