

The Impact of Artificial Intelligence on Employment and Income Distribution

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Abstract. This study delves into the extensive ramifications of AI's proliferation on employment and income distribution, especially in light of the COVID-19 pandemic, by examining job displacement, the emergence of new roles, and the widening income gap between high and low-income groups. The integration of AI into industries has had a significant impact on employment. It has led to the automation of routine and repetitive tasks, resulting in job displacement, especially in the manufacturing and administrative sectors. However, this phenomenon is not solely marked by job loss. AI has also brought about job transformation, necessitating individuals to acquire new skill sets and collaborate effectively with AI systems. This transformation has paved the way for new employment opportunities, particularly in AI engineering, data science, AI regulation, and the development of AI-driven technologies like self-driving vehicles. These changes underscore the need for adaptability in the workforce and have potential implications for income distribution, as high-skilled AI-related positions offer higher salaries, contributing to income inequality. The proliferation of AI has brought about both challenges and opportunities in employment and income distribution, with job displacement coexisting alongside the emergence of new roles. The COVID-19 pandemic has underscored the need for workforce adaptability, emphasizing the importance of addressing income inequality as we move into an AI-dominated era to foster a more equitable future.

Keywords: Artificial Intelligence; Employment; Income Distribution.

1. Introduction

1.1. Background

Artificial Intelligence (AI) has emerged as one of the most transformative technological advancements of the 21st century, aiming to reshape industries, economies, and societies. AI refers to the intelligence of machines, particularly computer systems, to perform tasks that typically require human intelligence. AI, as opposed to the brightness of human beings, has already illustrated excellent capability in problem-solving, decision-making, and language consciousness. Several languages are model-based chatbots, such as ChatGPT, Bard, Bing, and Ernie Bot have already stepped into people's lives and facilitated a lot in people's workplaces. As AI develops into a more elaborate and practicable resource, its integration into various sectors raises people's awareness of AI's effect on employment and income distribution.

The global COVID-19 pandemic has had a profound impact on economies, leading to widespread job losses, business closures, inflation, and reevaluation of traditional business models. The significant drop-in economic activity inevitably leads to a recession. Since 2020 and 2021Q4, a great number of small and medium enterprises (SMEs) suffered unpredictable economic pressure and some of them were forced to shut down. In order to strive for the economy and adapt to the environment. Business corporations tend to use AI models instead of hiring people for certain positions of jobs. This led to a surge in unemployment rates across many countries, affecting various industries including hospitality, travel, retail, and manufacturing. Moreover, the workers were disproportionately affected under such circumstances. The pandemic highlighted and exacerbated the existing income inequality.

This shift is driven by the potential advantages that AI provides in terms of efficiency, cost-effectiveness, and adaptability. Many advantages brought by using AI, including cost-efficiency, accuracy, and data analysis, all of which contribute to the mainstream of substituting people with AI.

1.2. Related Research

Martens and Tolan conducted analysis and research on the impact of technologies and automation in general on employment rate and income distribution. With analysis of economic characteristics, the author found that the effect can be negative when machines only substitute people, and positive when it complements human workers to increase productivity. The author also states that it is vital to find a balance between human input and machine productivity to generate additional employment [1]. Makridakis studies the impact of the industrial and digital revolution on several social aspects including employment. The research proposed that employment dropped from 2.5% to 0.7% in agriculture and from 17% to 14% in manufacturing in the USA and correspondingly from 2.1% to 1.3% and from 21% to 15% in the UK. The author emphasizes the need to address AI risks while also acknowledging its potential benefits, urging collaboration to navigate this transformative landscape. It would be a great pity if we forfeit the advantages the new technologies could bring to society [2]. Aly addressed the concern that Artificial Intelligence and Digital transformation raised to modern society and their impact on productivity and employment rates. The author Employing descriptive analysis and quantitative estimation using DEI as a digital transformation proxy, positive relationships were found between digital transformation, economic development, and labor productivity. However, the impact on employment requires further examination, particularly regarding gender and vulnerable employment [3]. Koski and Husso research four perspectives of economy, ethics, skill, and employment under the impact of artificial intelligence. Focusing on employment and growth, the author states that Artificial intelligence's impact on work and employment varies among individuals and can alter income distribution. It has the potential to affect both routine and high-skilled tasks, potentially leading to increased inequalities and social disruptions. These challenges require the evolution of economic and societal institutions [4].

Nilsson analyzed the impact of AI on the employment rate and proposed a consequence of work-eliminating agreement since people tend to use their time for activities rather than their jobs. The author states that it would be foolish to slow progress toward automation and people should treat unemployment as a liberating development. The productivity that AI brings to human society is essential for healthy long-term development [5]. Barbieri et al. analyzed how employment is impacted by AI, automation, and robots. By analyzing theoretical models, previous empirical evidence and job polarization, and trends, the author concludes that the outcomes vary between different countries and times. Even though the existence of job-creating effects optimizes the overall circumsphere, different studies on employment rate show a reduction ranging from 9% to 47%. However, when considering the detailed task classification, there is complementary to new technologies. It underlines the skilled-based nature and polarization between high-skilled positions and lower and medium-skilled positions [6]. Vermeulen et al. researched the impact of automation, robots, and AI on employment in forthcoming decades with a detailed analysis of conceptual models, economic scenarios, and BLS data. The author underlines the effect of technological unemployment. The Results show minor job loss in technology-affected sectors, contrasting broader economic growth, and administrative job increase is subdued compared to overall job creation, possibly due to technology-induced [7]. Franken and Wattenberg illustrate how the employment rate is affected when AI becomes a driving force in business. The author states the importance of incorporating insight to promote technological transformation when the risk of replacement exists. The skill requirement would change under such circumstances, and therefore the process of rethinking must hold on stage [8]. Yang analyzed AI's impact on productivity and employment. With an in-depth longitudinal analysis of Taiwan patent data and Algorithms on productivity, the author concludes that an increase in granted AI patents by 10% led to about 5% higher productivity and approximately 3.5% more employees in electronics firms. However, AI technology's influence on workforce composition, favoring high-skilled labor, proved nonlinear and complex [9]. Aghion et al. analyzed AI's influence on employment. With an analysis of the AJJ model, the author emphasizes the role of institutions and policies in determining AI's effects. AI can foster growth by replacing labor with capital, but competition policy matters. Analyzing AI's effects on employment, it finds robotization reduces employment and affects non-

educated workers more. Further analysis is needed to bridge sections and explore innovation and well-being impacts [10].

1.3. Objective

This research paper primarily examines how AI proliferation affects employment, wages, and income inequality. It discusses mixed research findings on AI's impact on the job market, recognizing concerns about job displacement while emphasizing AI's potential to enhance productivity and complement human workers. The paper also cites historical evidence suggesting that prior waves of innovation resulted in increased employment and higher incomes. The second part focuses on AI's influence on employment, and the third part focuses on AI's influence on income.

2. AI's Influence on Employment

2.1. Job Displacement

The integration of AI into industries has displaced specific job roles, particularly those involving repetitive and routine tasks. This automation has led to a decreased demand for positions once performed by human workers. Notably, fields like manufacturing and assembly line jobs have experienced transformations, with robots assuming responsibilities, thereby reducing employment opportunities. Furthermore, the impact of AI is evident in areas such as data analysis and predictive modeling, where tasks that were previously manually executed have now been automated using AI algorithms. This technological shift has extended its influence to specific administrative and clerical roles, affecting employment in these sectors. This explains the concerns held by 27% of employees who worry that innovations, robots, or artificial intelligence could render their jobs obsolete within the next five years. Additionally, 49% believe that AI has already led to job losses as organizations increasingly embrace automation and AI technologies. While automation and AI have the potential to enhance productivity and stimulate economic growth, there is a growing recognition that many individuals worldwide may need to consider transitioning to different occupations or upgrading their skill sets to remain competitive in the evolving job market. Estimates suggest that AI adoption could potentially automate up to one billion jobs globally, with as many as 375 million jobs becoming obsolete in the coming decade. By 2030, it is predicted that 45 million Americans will lose their jobs to AI automation, highlighting the scale of the workforce transformation driven by artificial intelligence. However, it's important to acknowledge that there is a range of opinions on the extent of AI's impact, with estimates varying based on different research methodologies and considerations.

2.2. Job Transformation

Integrating AI into various industries catalyzed a significant transformation of existing roles. This transformation is driven by employees' need to acquire new skill sets that allow them to collaborate with AI systems effectively. An example lies within the domain of customer service. Previously, routine inquiries were handled exclusively by human agents, consuming considerable time and resources. However, these routine interactions can now be efficiently managed with the emergence of AI-powered chatbots. This shift has enabled human agents to redirect their attention towards more intricate and compassionate interactions that necessitate emotional intelligence and nuanced problem-solving skills. By leveraging AI to handle routine queries, companies have improved efficiency while enhancing customer experiences by cultivating deeper human-AI collaborations.

2.3. Job Creation

Despite concerns surrounding potential job loss, integrating AI into various industries has spurred the creation of new employment opportunities in several key areas. This phenomenon can be attributed to the specific demands arising from AI systems' development, deployment, and maintenance. One of the most notable areas of job creation is within the realm of AI engineering.

Skilled professionals specializing in AI engineering are in high demand to design and construct the intricate algorithms and architectures that power AI systems. These individuals possess expertise in machine learning, neural networks, algorithm optimization, and other technical skills. Similarly, the role of data scientists has become increasingly vital, as they are responsible for collecting, analyzing, and interpreting the vast amounts of data necessary to train and improve AI models. Another consequence of AI's expanding role is the emergence of positions focused on AI regulation. As AI technologies become more prevalent in critical decision-making processes, the need for individuals adept at navigating the ethical challenges and potential biases associated with AI has grown substantially. Professionals specializing in ensuring fairness, transparency, and accountability in AI systems are crucial to preventing unintended negative consequences. The rise of AI also impacts the field of automatic vehicles, this innovative sector demands a diverse range of professionals, including robotics, sensor technology, and software development experts. These specialists collaborate to create self-driving vehicles that rely on AI-driven systems to navigate and make real-time decisions in a complex environment.

The predictions from the World Economic Forum and McKinsey Global Institute underscore the transformative potential of AI on the job market. According to the World Economic Forum, AI is expected to give rise to approximately 97 million "jobs of tomorrow" by 2025, primarily in sectors that harness AI for optimization, product development, logistics, predictive maintenance, and robotics. This indicates that AI when strategically integrated, acts as a catalyst for productivity enhancement and the creation of entirely new employment prospects. McKinsey Global Institute's estimates align with this trend, suggesting that AI could contribute to the generation of millions of fresh job opportunities by 2030, spanning diverse industries such as healthcare, technology, and finance. Importantly, these emerging roles are characterized by their demand for a blend of technical expertise and uniquely human skills, underlining the critical role of both technological and human capabilities in the AI-driven job landscape.

3. Income

3.1. Income Inequality

With AI's development, there is an inevitable decline in income for manual and simple labor. Many traditional manual and simple labor jobs risk being replaced by machines and automated systems. The reduced demand for these jobs has led to lower wages, exacerbating income inequality among lower-income groups in society. At the same time, the rise of artificial intelligence has created new high-skilled positions, such as algorithm engineers and data scientists. These roles typically require complex technical skills, resulting in higher salaries. The emergence of these high-paying positions further widens the gap between high-income and low-income groups. With the prevalence of artificial intelligence, gaining relevant education and skills has become increasingly important. Those who adapt to technological changes and possess the necessary skills are more likely to find employment in high-paying positions. In contrast, individuals without relevant training or education may find themselves in low-paying jobs. With the expanding income inequality, governments and social institutions may need to take measures to mitigate this trend. This may include providing broader educational and training opportunities to help people acquire the required skills and implementing policies to ensure fair compensation and social welfare.

3.2. AI's Impact on E-commerce and online live streaming

AI has had a profound impact on the e-commerce sector. It is used in personalized recommendation systems to suggest products to users based on their preferences and purchase history. This increases conversion rates and boosts the revenue of e-commerce platforms. Additionally, AI is employed in automating customer service through chatbots and virtual assistants, providing real-time support and enhancing the user experience. This helps maintain customer satisfaction and encourages repeat purchases, thereby increasing sales. AI also plays a significant role in the online live streaming and

entertainment industry. Many content creators and platforms utilize AI technology for content generation, editing, and enhancement to improve the quality and appeal of their content. AI is also used for real-time translation, breaking language and geographical barriers for live content, and expanding the audience base. AI-driven targeted advertising and personalized ad placement further enhance the advertising revenue of online live streaming. Additionally, AI-supported virtual hosts and virtual reality technologies have opened up more revenue-generating opportunities in the online live-streaming sector.

The shift in consumer attention towards video and live-streaming content is a significant trend in the digital landscape, and platforms like TikTok have harnessed this trend to their advantage. TikTok's success can be attributed to its ability to capture the attention of a vast user base. As of mid-2022, TikTok boasted an impressive 680 million monthly active users, underlining its position as a dominant player in the social media and content-sharing space. One key aspect that sets TikTok apart is its innovative approach to content monetization. TikTok has recognized that engaging content is not just a means of entertainment but also a powerful tool for commerce. To leverage this, TikTok has developed an e-commerce model around content. This model involves connecting users with products and brands seamlessly within the TikTok platform. This approach has transformed traditional advertising into more immersive and user-friendly experiences. The financial success of TikTok's e-commerce endeavors is evident in its substantial e-commerce sales, amounting to 638.4 billion yuan. This underscores the platform's ability to convert its massive user base into active consumers. As TikTok continues refining its e-commerce model and offers more tools for creators and businesses to monetize their content, it will likely remain a dominant force in the digital marketing and e-commerce landscape.

4. Conclusion

This research paper primarily focuses on the impact of AI proliferation on employment, wages, and income inequality. It discusses the mixed conclusions from current research regarding how AI technology affects the job market. It acknowledges the concerns about job displacement due to AI but also highlights the potential for AI to complement human workers and boost productivity. It also explores historical evidence that suggests past waves of innovation ultimately led to job creation and higher incomes.

AI proliferation on employment and wages presents mixed conclusions, offering both negative outcomes if AI replaces human labor and positive prospects if AI complements human workers to boost productivity. This positive scenario could elevate labor productivity, influencing demand shifts within sectors and industries, while also impacting wage dynamics and prompting workforce reallocation. Concerns about human displacement by AI machines are apparent, yet historical evidence suggests that past waves of innovation, though challenging, ultimately generated more jobs and higher incomes. Forecasts for AI's impact vary widely, from 47% to 9% of jobs at risk of automation, depending on task definition granularity. These alarming predictions emphasize displacement effects but often overlook potential employment creation. AI's potential lies in enhancing productivity and economic growth, constrained by non-automatable factors essential to production. Macro outcomes of AI are influenced by firm behavior, leading to significant reallocation implications. AI's uniqueness stems from its machine learning core resembling a general-purpose technology, swiftly spreading across tasks and industries. The potential for AI to automate innovation and idea production, previously human domains, poses intriguing prospects. The challenge is to understand AI's role as a technology that swiftly spreads across sectors. The evolving landscape requires well-designed social and redistributive policies to address the turbulence of declining employment alongside increased productivity and incomes, fostering effective resource allocation and comprehensive societal well-being.

The advent of artificial intelligence (AI) has brought about a dual impact on our society. On the one hand, it has triggered a concerning increase in income inequality as traditional manual and simple

labor jobs are gradually replaced by machines, resulting in lower wages for lower-income groups. Conversely, high-skilled positions in AI-related fields, like algorithm engineering and data science, offer lucrative salaries, further widening the income gap. Consequently, the importance of acquiring relevant education and skills to adapt to technological changes must be considered, as those who do are more likely to secure high-paying positions, while others may find themselves in low-paying jobs. To address this growing disparity, governments and social institutions must implement policies to provide comprehensive educational and training opportunities and ensure fair compensation and social welfare.

Simultaneously, AI has revolutionized the e-commerce and online live-streaming sectors. Personalized product recommendations, automated customer service, and content enhancement have enhanced user experiences, boosted sales, and increased advertising revenue. Platforms like TikTok have harnessed AI to connect users and products through content, amassing massive traffic and driving e-commerce sales. As AI continues to shape these industries, its transformative power is undeniable, altering how we work consume and interact with digital content.

In a world marked by mixed research conclusions regarding AI's influence on employment and wages, individuals and businesses must adopt adaptable strategies. Continuous learning and skill development are paramount, with a focus on digital literacy and AI-related competencies. Embracing AI as a complement rather than a replacement for human labor is essential for companies, necessitating strategic workforce planning and innovation. Governments should implement policies supporting education, worker safety nets, and equitable AI-driven growth. Privacy and ethics will take center stage, requiring responsible practices. Collaboration among stakeholders will be key in navigating the rapidly evolving AI landscape, fostering a future where challenges are met with proactive solutions.

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