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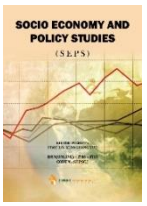

RESEARCH ARTICLE

RESEARCH ON THE REALIZATION PATH OF INCLUSIVE EMPLOYMENT STRUCTURE UNDER THE APPLICATION OF ARTIFICIAL INTELLIGENCE

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ABSTRACT

In recent years, with the rapid development of science and technology, artificial intelligence has permeated human production and life. The technology revolution led by AI has become an important driving force to promote industrial transformation and upgrading, and has had a profound impact on the employment of social labor force. This study analyzes the different effects of the development and application of AI on employment and its influence mechanism through literature survey method and inductive analysis method, and finds that AI not only has a significant impact on employment, but also has significant industrial, regional, and gender differences, which profoundly affects China's labor market and the employment structure of the workforce. In view of this, this study is committed to exploring effective paths to expand the positive effects of AI on the labor market and employment structure, guiding the construction of an inclusive and adaptive social labor force employment structure, forming a development situation in which the scientific and technological revolution and industrial change complement each other, and truly realizing the high-quality development of science and technology-enabled industries for the benefit of mankind.

KEYWORDS

artificial intelligence; employment quantity; employment structure; substitution effect; creation effect; heterogeneity; inclusiveness

1. INTRODUCTION

As the breadth and depth of the development of artificial intelligence (AI) continues to extend, it has an impact on employment in various aspects. In the long run, the development of AI will promote the transformation of employment from quantity-expansion-led to quality-improvement-led, with a more obvious substitution effect on low-skilled labor, and But it has a creation effect on high-skilled labor; in the short term, the impact of AI on total employment is relatively mild, but there exists heterogeneity in terms of employment industries, regions, groups, etc., and thus structural contradictions in employment will be in an upward spiral (Autor and Dorn, 2013; Frey and Osborne, 2017; Yang et al., 2018; Chen and Fan, 2023; Luo and Chen, 2022; Ming et al., 2023; Sun and Liu,2023; Acemoglu and Restrepo, 2018; Acemoglu and Restrepo, 2020; Li and Zhou,2022; Bessen, 2023). Along with the widespread spread of "artificial intelligence panic", building an inclusive employment structure is of great significance for stabilizing the labor market, coping with the employment risks brought about by intelligent technology, resolving structural conflicts in employment, and narrowing the income gap (Benzell et al.,2015; Ampatzidis et al., 2017; Yang and Qiu, 2020; Shi and Ye, 2023). Therefore, around the socio-economic impact of AI development, further in-depth research is needed to help expand the positive impact of AI on the labor market and employment structure.

2. CURRENT STATUS OF ARTIFICIAL INTELLIGENCE DEVELOPMENT AND APPLICATION

In order to grasp the driving force of the new round of scientific and technological revolution and industrial change, China has introduced a series of relevant policies since 2015 to better promote and plan the development of artificial intelligence. From the scale of AI development, thanks to the continuous introduction of policies in the field of AI and the continuous optimization of the market environment, China's AI industry is booming, with the scale of China's AI industry in 2020 being 303.1 billion yuan, the scale of China's AI industry in 2021 being as high as 404.1 billion yuan, and the scale of the core industry in 2023 reaching 500 billion yuan, which is a rapid and stable growth. As of 2023, the number of AI enterprises in China exceeds 4,300, and innovations continue to emerge. From the point of view of the geographical distribution of AI enterprises, at present, Beijing, Shenzhen, Shanghai and Hangzhou have become the focus point for the development of China's AI industry, leading the rise of AI technology in the Beijing-Tianjin-Hebei Development Zone, Guangdong-Hong Kong-Macao Greater Bay Area, and the Yangtze River Delta Economic Zone in a point-by-point manner, and covering the whole country.

In addition, the continuous development of AI has formed a complete industrial chain from core technology research and development, intelligent terminal manufacturing to intelligent applications in the industry, and its applications have been continuously extended to specific industries or scenarios, and have been deeply integrated with traditional industries, and its applications include intelligent home, intelligent education, intelligent medical care, intelligent transportation, intelligent customer service, drones, robots, and so on. The application and development of artificial intelligence provides more comprehensive and intelligent solutions or high-tech products for the upgrading of traditional industries, promotes the intelligentization of agriculture, the intelligentization of industry and the professionalization of the service industry, boosts the transformation and upgrading of the industrial structure and continuously accelerates the construction of a modernized economic system. With the many benefits brought by the development and application of AI, it has also triggered many thoughts among scholars about the synergistic development of AI and the upgrading of labor

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employment structure (Gregoryet al., 2019; Qiu and Du,2019; Yang and Qiu,2020; Xieet al., 2020; Li et al., 2023).

3. The Impact of Artificial Intelligence Application on Employment and Employment Structure

The application and development of artificial intelligence makes the employment of labor force in China face many new challenges and risks. Many studies have focused on the employment effect of AI, discussed the impact of AI on employment scale and employment structure, and further analyzed the mechanism and path of the impact of AI on employment. Most of the research conclusions have proved that AI technology has a significant impact on employment and there exists heterogeneity in terms of industries, groups, fields, etc. Further analysis shows that the various employment effects of AI are also affected by the differences in the development stage of AI and the differences in the degree of integration between AI and the economy and society.

First of all, in the short term, AI has a significant employment substitution effect on the labor force in low-skill sectors and industries. With the continuous innovation of AI technology, many traditional jobs have been replaced by automation and intelligence, and the demand for some simple and repetitive jobs, clerks, salesmen, etc. has decreased.

Secondly, the long-term development of artificial intelligence and the expansion of the scope of application will produce employment creation effects. This is due to the fact that the development of AI puts new requirements on the accumulation of human capital in the labor force, leading to changes in skill requirements, and thus creating profound changes in skill requirements in the job market. Traditional skill requirements are replaced with higher-level skill requirements, which not only require the mastery of specialized knowledge such as machine learning, natural language processing, algorithm design, etc., but also for the emerging digital economy, intelligent manufacturing, virtual reality and other fields, a number of new positions will emerge, such as data analysts, intelligent robotics engineers, virtual reality designers and so on.

Again, with the gradual penetration of AI into traditional industries, the application of AI technology has a far-reaching impact on the reconfiguration of the industrial structure and industrial chain, thus bringing about a deep integration of the industrial structure. Some traditional manufacturing, logistics and financial industries need to accelerate their digital transformation, improve efficiency and productivity by introducing AI technology, and promote the upgrading and transformation of industrial structure.

Finally, the widespread application of AI technology may lead to the widening of the labor income gap. On the one hand, some emerging fields and positions may create more high-paying jobs. On the other hand, some traditional fields and positions may face the risk of unemployment, and these people may face the risk of income decline and impoverishment.

From this point of view, the development and application of AI technology has further accentuated the uncertainty in the job market, which has an inevitable impact on employment and has a radiating effect on the demand for many emerging positions and the changing trends of the job market in the future, which is a challenge for both job seekers and employers.

4. Path Analysis of the Impact of Artificial Intelligence Technology on Employment and Employment Structure

4.1 Analysis of the Influence Path of the Employment Substitution Effect of Artificial Intelligence

4.1.1 Low-Skill Sectors Promote "Machine-For-Man"

Driven by the rapid development of artificial intelligence technology, some enterprises have accelerated the pace of "machine for man", resulting in some repetitive and standardized jobs being replaced by robots. Enterprises use intelligent machines to deeply integrate the production process, gradually forming automated and intelligent production models and production lines, and promoting the "technological dividend" to replace the "demographic dividend". The massive use of artificial intelligence machines in production has created an employment crowding-out effect, reducing the demand for human labor and leading to the layoff and unemployment of low-skilled workers.

4.1.2 Demand for High-Level Labor is Climbing

With the development of artificial intelligence, the social and economic development of the society has an increasing demand for high-level laborers in the basic research of artificial intelligence, programming technology, research and development of intelligent chips and sensors, research and development and manufacturing of data technology and services, etc., and the knowledge and skill requirements of laborers for new types of jobs such as human-computer interaction, equipment operation, system maintenance, etc., arising from industries driven by the application field related to the field of application, etc., and the demand for highly-skilled talents to adapt to the requirements for the development of the new industry will be greater and greater.

4.1.3 Integration of Artificial Intelligence and Industrial Penetration

With the in-depth application of artificial intelligence in various fields of the economy and society, the integration of artificial intelligence with traditional industries and the real economy has been deepening, and artificial intelligence products have gradually become a key element in the production process, and have reflected great advantages in the production process. The increase in productivity brought about by the development of artificial intelligence technology is beyond the reach of pure labor input, automated operation, lower error rate, higher finesse and speed make artificial intelligence replace some jobs, or cut redundant jobs, thus bringing about a reduction in the demand for labor by enterprises.

4.2 Path analysis of the impact of the job creation effect of artificial intelligence

4.2.1 Technological Applications of Artificial Intelligence Extend New Jobs And New Tasks

First, with the large-scale use of AI, socio-economic development has created an increasing demand for high-level laborers in R&D and manufacturing of AI basic research, programming technology, smart chip and sensor R&D, and data technology and services. Secondly, with the rapid development of smart cities, smart marketing and new retail, smart education, and smart culture and tourism, the knowledge and skill requirements for laborers in new types of jobs such as human-computer interaction, equipment operation, and system maintenance, etc., arising from industries related to driven by the application fields, are also getting higher, and the demand for highly-skilled talents adapted to the development requirements of the new industries will be increasing.

Furthermore, the working environment of workers will be further improved, and the improvement of labor productivity will inevitably lead to a further shortening of working hours, and people's needs in the areas of leisure, entertainment, health, medical care, education, tourism and other aspects will become more diversified, which will promote the emergence of new and more refined industries and the generation of many new occupations, and create more employment opportunities.

4.2.2 Short-Term Boost To Manufacturers' Labor Demand

As the application of artificial intelligence in China now has a more obvious role to play in the intelligent development of manufacturing. As AI technology improves labor productivity, when the elasticity of demand for products is high, the decrease in the cost of products leads to an increase in the demand for products, and manufacturing enterprises expand their production, thereby increasing the demand for labor for non-automated tasks as well as the demand for labor for "human-machine collaboration" positions.

4.2.3 The Comparative Labor Advantage Of AI At This Stage Is Still Limited

At present, the stage of development and application of artificial intelligence in China still belongs to the primary stage, thus in the short term, artificial intelligence technology can replace part of the labor force engaged in simple, repetitive and other tasks, but it can not replace the high social frequency as well as very creative tasks with comparative advantage in labor. Therefore, these new jobs and functions with comparative advantages in labor have shown a counterforce to the employment substitution effect of artificial intelligence, thus largely offsetting the impact and damage to the labor market brought about by the substitution effect.

4.3 Analysis of the Mechanisms of the Structural Employment Impact of Artificial Intelligence on the Labor Force

From the initial stage of the development of AI, it has the least impact on the agricultural production sector and the greatest impact on the labor force in the manufacturing sector, which gradually shifted to the service sector. This is due to the fact that, for one thing, AI affects employment in the agricultural production sector. The application of AI technology in

agriculture can change the way farmers produce. Artificial intelligence has been used in agricultural automation, and the increased automation of agricultural production will reduce the amount of labor employment in the agricultural production sector. The number of workers in the primary sector will decrease significantly due to technological advances, which means that the labor force will be shifted from the agricultural sector to other sectors of production.

Therefore, the development of artificial intelligence technology, while transforming the mode of agricultural production and improving the efficiency of agricultural production, reduces the employment of labor in the agricultural sector and has a substitution effect on the employment in the agricultural sector, which is due to the fact that the deepening of the scale of production, automation, and the degree of intelligence affects the demand for farmers in the agricultural production, and makes the surplus labor in the agricultural sector transfer to the industrial and service production sectors. The shift of surplus labor in the agricultural sector to the industrial and service sectors.

Second, AI affects employment in the industrial sector. The increase in the number of industrial robots is related to the increase in labor productivity, the use of industrial robots and labor force employment is a reverse relationship, with the decline in the price of industrial robots, the industrial production sector will increase the demand for robots and reduce the demand for labor, which will reduce the employment of low-skilled labor, and the use of industrial robots and the employment and wages are in the opposite direction of the change in the relationship between employment and wages, resulting in the proportion of employed people. decrease.

Third, AI can affect employment in the service sector. The development and application of AI has led to an increase in the demand for employment in jobs with low repetition rates and high socialization. The change in the share of AI in the service sector depends on the prospects for the application of AI in the industrial and service sectors; if the share of AI application in manufacturing is significantly larger than that in the service sector, then AI will promote the development of the service sector, and conversely, it may increase the share of manufacturing.

5. EXPLORING THE PATH TO AN INCLUSIVE EMPLOYMENT STRUCTURE

5.1 Accelerating The Promotion of Industrial Transformation And Upgrading

Considering that technological progress brings about inevitable technical and structural unemployment in the short term. Therefore, for the general labor force, it is necessary to continuously improve their quality and skills through education and training to meet the new demand for skills. Around this issue, the first lies in the need for individual workers to actively improve their cognitive skills and actively adapt to the development trend of artificial intelligence. From an individual perspective, workers need to adapt to changes in skill demand, master new technologies and knowledge, actively face changes and challenges, and promote inclusive employment through self-improvement and adaptation to the changing job market. For example, they should continuously learn new skills and knowledge to improve their competitiveness; develop diversified career development paths to find positions and opportunities that suit them; pay attention to the changing trends and development direction of the labor market, and make good career planning and adjustments, so as to better adapt to the employment needs in the era of artificial intelligence.

Secondly, the education sector should further strengthen the research and application of AI technology, establish a subject system that keeps pace with current developments, and explore educational paths for the harmonious development of AI and human beings. Promote inclusive employment by optimizing the curriculum and teaching methods. For example, comprehensive AI education should be provided for students to enable them to master relevant skills and knowledge; interdisciplinary cooperation should be strengthened to cultivate talents with multidisciplinary backgrounds and comprehensive abilities; and a vocational education and skills training system should be established to provide more flexible learning methods and training programs for people in career transition and re-employment, and to provide opportunities for workers to acquire new skills and knowledge, thereby enhancing their competitiveness.

In addition, the relevant government departments should strengthen the supervision of the labor market, integrate and optimize the talent management strategy, and prevent the discrimination of artificial intelligence technology against workers. Enterprises should provide targeted training for each position to enhance the degree of cooperation between workers and AI, so as to achieve a "human-machine collaboration" work mode as soon as possible. For example, they should provide career development opportunities and training programs to support employees' self-improvement and growth; adopt diverse hiring standards and recruitment methods to eliminate discrimination and prejudice, and encourage and accommodate diverse talents. Inclusive talent management strategies promote inclusive employment and create a more stable, fair and attractive job market.

Finally, the government should quickly make emergency plans and early warning mechanisms, promptly introduce corresponding employment compensation mechanisms and social security systems, focus on front-line workers in manufacturing enterprises that are more affected by AI, and make arrangements for the transfer of such workers to other jobs and re-employment training in advance.

5.2 Harmonization of Imbalances In Inter-Regional, Inter-Industry And Inter-Enterprise Development

At present, it has become a consensus that artificial intelligence has a significant impact on employment, and a large amount of empirical evidence confirms that there is heterogeneity of artificial intelligence among regions, industries and enterprises, and that there are stage characteristics at different stages of the development of artificial intelligence. Therefore, coordinating the scientific and orderly development of AI among regions, industries and enterprises is of great significance for optimizing the employment structure of the workforce and promoting high-quality development.

First of all, in view of the regional development differences of artificial intelligence, each local government, according to the local economic and social and enterprise development situation, business characteristics, affordability, etc., according to local conditions, continue to introduce and implement employment security related policies.

Secondly, taking fully into account the degree of penetration of AI technology among industries, the government should formulate differentiated unemployment subsidies, employment guidance and vocational training policies for different skill sectors in response to the industry differences in the employment impact of AI, so as to alleviate the negative impact of AI technology on the industry.

Finally, the enterprise differences in the employment effects of AI are made possible by the different scales of development and technological capital investment of different enterprises. With the accelerated penetration and integration of artificial intelligence and education and training, the advantageous enterprises with more advanced artificial intelligence application technology can more significantly improve the training efficiency and effect, so as soon as possible to improve the quality and skills of the internal labor force, and then expand the scope of work tasks that the labor force can achieve in order to better complete their own industrial development transformation of butterfly goal to alleviate the technical unemployment problem. Therefore, the relevant government departments should pay more attention to the application of artificial intelligence in small and medium-sized enterprises that are relatively weak in technology application and investment, actively guide small and medium-sized enterprises to develop in the direction of "human-machine collaboration", and moderately control the scale of automation in low-skill sectors, so as to prevent large-scale unemployment brought about by the relative ease of penetration of artificial intelligence.

5.3 Follow-Up on Improving The Social Security System

With automation and robots replacing some traditional jobs, the government and enterprises need to consider how to provide better social security in the face of the impact of the development and application of AI technology on some jobs and industries, strengthen the construction of the social security system, formulate more inclusive employment security policies to ensure equality and fairness in the job market, promote the diversification of jobs and employment opportunities, and protect the rights and interests of workers; improve the coverage and level of protection of unemployment insurance and social assistance to provide more protection and support for those who may be replaced by AI. rights and interests, and ensure fair competition in the labor market; improve the coverage and level of protection of unemployment insurance and social assistance, and provide more protection and support for those who may be replaced by AI, for example, by protecting the welfare and rights and interests of the unemployed and retirees, and providing them with better livelihood security.

5.4 Addressing the Digital Intelligence Divide for Vulnerable Groups

As the impact of AI on employment is also heterogeneous among different groups, with the key influencing factors being the prevalence of digital technology and the acquisition of skills to apply it, it is important to further promote digitally inclusive development in the future: ensuring the prevalence of digital technology and bridging the digital divide so that more people can benefit from the application of AI. Governments and enterprises should strive to make digital technology more widely available and provide appropriate and suitable digital technology training for the workforce at all cultural levels and ages.

6. Conclusion

Overall, this study concludes that in dealing with the employment challenges posed by AI, it is necessary for the government, enterprises, educational institutions and individuals to work together to explore the path of building an inclusive employment structure. This is achieved through a variety of ways, including macro policy orientation, vocational training system construction, industrial digital service improvement, and social security and support, so as to cope with the impact of AI on employment with appropriate measures and strategies, realize the harmonious coexistence of AI and human beings, and promote the sustainable development of society. In the future, in order to realize the tendency to benefit and avoid harm in the development of intelligent science and technology, it is necessary to actively expand the employment creation effect in promoting the development of AI applications, and to further practice and explore specific measures to strengthen AI education, enhance vocational skills training, and improve the employment security system, so as to vigorously cultivate composite talents adapted to the era of AI, and to continually improve the labor skills of workers whose adaptability to the changes of the new technology, so as to effectively resolve the structural impact of AI on employment. The structural impact of artificial intelligence on employment will be effectively resolved, so as to realize fuller and higher-quality employment.

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