Proceedings of ICEMGD 2025 Symposium: Innovating in Management and Economic Development
DOI: 10.54254/2754-1169/2025.LH27686

Research on the Impact of Digital Economy Development on China's Labor Force Employment and Countermeasures

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Abstract. In recent years, the digital economy industry in China has developed vigorously, gradually becoming an important supporting force to promote China's economy, and the development of the digital economy has also affected China's labor market. This paper focuses on the impact of digital economy development on China's labor employment and corresponding strategies. First, this paper cites relevant data to clarify the significant role of the digital economy in economic growth, as well as the current status and structural contradictions in labor employment. Subsequently, it analyzes the impacts of the development of the digital economy on labor employment from both positive and negative perspectives. Positively, it creates job opportunities, enhances employment efficiency, and improves workers' skills. On the negative side, it gives rise to structural unemployment, exacerbates employment inequality, and brings to the fore challenges related to rights protection. Finally, it proposes measures such as strengthening digital skills training and promoting industrial integration, emphasizing the need for multiple measures to achieve a positive interaction between the two.

Keywords: Digital Economy, Labor Force Employment, Employment Impact, Structural Unemployment, Digital Skills Training

1. Introduction

In recent years, China's digital economy has gained significant momentum and has become a new engine for economic growth. According to data from China's Ministry of Industry and Information Technology, China's digital industry revenue will reach 35 trillion yuan in 2023, accounting for 36.2% of GDP, and the importance of the digital economy in the national economic system continues to rise [1]. At the same time, China's labor market faces numerous challenges, including employment restructuring and the imperative to enhance employment quality, and the impact of digital economy development on labor employment has become the focus of attention of academics and policymakers [2,3]. In this context, it is of great practical significance to study the impact and countermeasures of digital economy development on China's labor force employment.

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2. The development of China's digital economy and labor employment

2.1. Current status of digital economy development

In recent years, the scale of China's digital economy has continued to expand. From 2019 to 2023, the scale of the digital economy increased from 35.9 trillion yuan to 53.9 trillion yuan, with its share of GDP rising from 36.2% to 42.8%. In terms of industrial structure, digital industrialization has developed steadily, with the digital industry—represented by electronic information manufacturing, telecommunications, software and IT services, and the internet industry—experiencing sustained growth. In 2023, the added value of digital industrialization will reach 10.09 trillion yuan, accounting for 18.7% of the digital economy. Industrial digitalization is accelerating, the pace of transformation and upgrading of traditional industries using digital technology is accelerating, and the level of digitalization in manufacturing, agriculture, service industries and other fields is constantly improving. In 2023, the added value of industrial digitalization will reach 43.84 trillion yuan, accounting for 81.3% of the digital economy [1].

From the perspective of the geographical distribution of digital economy development, the eastern region has a high level of digital economy development due to its economic foundation, technological innovation capabilities, and talent advantages [4]. For example, Guangdong, Jiangsu, Zhejiang and other provinces rank among the top in the country. The central and western regions are also developing rapidly, and Guizhou and other places have made remarkable achievements during the development of characteristic fields such as big data industry. In terms of policy support, the state has rolled out targeted policy backing for the digital economy, exemplified by the 14th Five-Year Plan for Digital Economy Development; meanwhile, local governments across the country have also formulated corresponding policies to enhance support for the sector.

2.2. Labor employment status

In terms of employment scale, China's employment has remained generally stable in recent years. According to the National Bureau of Statistics, there will be 734.39 million employed people nationwide at the end of 2024, including 473.45 million in urban areas. In 2023, the proportion of employed people in the primary, secondary and tertiary industries will be 25.1%, 27.7% and 47.2% respectively, and the proportion will be adjusted to 22 in 20242%, 29.0%, 48.8% [5]. The employment situation of different industries is obviously different, with employment scale in traditional industries such as manufacturing and construction declining, while emerging industries such as information and software are creating more jobs.

In terms of employment quality, workers' wages rose steadily, but the wage gap between different industries and regions is still large. Emerging sectors such as artificial intelligence (AI) and big data offer relatively higher wage levels for their employees, whereas traditional industries including agriculture and manufacturing are characterized by comparatively lower wage levels. In terms of working environment and labor security, emerging industries can often provide a better working environment and more complete labor security, and some enterprises in traditional industries need to improve in this regard.

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3. The positive impact of the digital economy on China's labor employment

3.1. Create new jobs

The digital economy has spawned numerous emerging occupations, such as artificial intelligence engineers, big data analysts, cloud computing engineers, e-commerce operators, e-sports athletes, etc. The emergence of these emerging has furnished workers with novel employment alternatives. Taking AI engineers as an example, the demand for AI engineers has grown dramatically with the widespread application of AI technology in various industries. According to relevant reports from the Ministry of Social Security, the talent gap in the field of artificial intelligence in China will exceed 5 million in 2024. The scale of employment in emerging occupations is also expanding, and the number of workers in new forms of employment represented by couriers and takeaway delivery workers has increased significantly. By the end of 2024, the number of couriers nationwide will reach 4.5 million, and the number of takeaway delivery workers will exceed 10 million.

From the perspective of industrial association, the development of the digital economy has driven the development of upstream and downstream industries, thereby creating more jobs. For instance, e-commerce has led to the development of logistics, warehousing, packaging and other related industries, increasing a large number of employment opportunities. In 2024, the national online retail sales will reach 15.52 trillion yuan, a year-on-year increase of 72% [6], and the number of new jobs in the logistics industry exceeded 1 million in 2024.

3.2. Improve employment efficiency and flexibility

Digital technology has greatly improved the efficiency of job matching. Recruitment platforms leverage big data and artificial intelligence technologies to precisely match job seekers' resume information with enterprises' hiring requirements, thereby reducing the search costs and time investment for both job seekers and employers. For example, the BOSS direct recruitment platform has improved the communication efficiency between job seekers and enterprises by more than 30% through intelligent matching algorithms.

Digital technology has made telecommuting widely used. According to data from the CNNIC, the number of online office users in our country will reach 570 million in 2024 [7]. Teleworking eliminates geographical barriers, allows workers to arrange working hours and locations more flexibly, improves work efficiency, and also provides employment opportunities for some people who cannot work in fixed office locations (such as people with disabilities and people in remote areas).

3.3. Improve the quality and skills of workers

The development of the digital economy has prompted workers to continuously learn new digital skills and knowledge to adapt to new job requirements. For example, traditional manufacturing workers need to learn automation control, programming and other related knowledge and skills in order to be able to operate intelligent equipment. In terms of improvement pathways, online learning platforms have played an important role. Platforms such as Tencent Classroom and NetEase Cloud Classroom provide a wealth of digital skills training courses, allowing workers to learn according to their needs and time. Enterprises are also attaching increasing importance to digital skills training for their employees, with many large enterprises having established internal training systems to deliver digital technology-related training programs.

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The improvement of workers' digital skills not only helps their personal career development and income level, but also helps to contributes to the enhancement of labor productivity across the entire economy. For example, marketers who master data analysis skills can formulate marketing strategies more accurately and improve the marketing effectiveness of enterprises, thereby enhancing the competitiveness of enterprises.

4. The negative impact of the digital economy on China's labor employment

4.1. Structural unemployment

The application of digital technology has replaced some repetitive and regular jobs with automated equipment or artificial intelligence. This is especially true in the process of promoting intelligent manufacturing, some factories have reduced a large number of front-line workers by introducing automation equipment. In the service industry, customer service positions have also been impacted by artificial intelligence, and many companies have adopted intelligent customer service instead of manual customer service.

Workers of different skill levels are affected to different degrees, with low-skilled workers being more vulnerable to the impact of digital technology, thereby facing a higher risk of unemployment. High-skilled workers adapt better to the digital economy's needs and gain more job opportunities. This has led to increased skills polarization in the labor market, further widening the income gap between different skilled workers.

4.2. Exacerbate employment inequality

In terms of the urban-rural digital divide, the development of digital infrastructure in rural areas remains relatively lagging, characterized by inadequate network coverage and low network speeds. This, in turn, leads to limited access among rural workers to information related to the digital economy and employment opportunities associated with it. According to the "Statistical Report on the Development of China's Internet Network", the rural Internet penetration rate in our country will be 65.6% in 2024, which is much lower than the 85.3% in urban areas [7]. This puts rural workers at a disadvantage in participating in digital economy employment.

There are also differences in employment among workers of different ages. Young people exhibit strong receptiveness to and proficiency in learning digital technologies, enabling them to better adapt to the requirements of digital-era jobs. However, the elderly often have difficulty keeping up with the pace of digital economy development and are at a disadvantage in job competition. For instance, young people dominate employment in the e-commerce sector, whereas older adults have limited access to participation in this field.

4.3. Protection of workers' rights and interests

Under the new employment environment, there is ambiguity in the determination of labor relations. The relationship between many platform economy practitioners and platforms is not a traditional labor relationship, which makes them face many problems in the protection of labor rights and interests. For example, takeaway delivery workers, ride-hailing drivers, etc., they lack clear legal protection in terms of working hours, labor remuneration, social insurance, etc. According to relevant surveys, about 70% of takeaway delivery workers do not sign formal labor contracts with the platform, and only about 30% of delivery workers participate in social insurance.

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In terms of labor intensity and work safety, workers in new forms of employment are also under greater pressure. In order to complete order tasks, takeaway delivery workers often need to run around in a short period of time, with high work intensity and traffic safety risks. Ride-hailing drivers drive for long periods of time and also face health problems such as physical fatigue.

5. Measures to deal with the impact of the digital economy on labor employment

5.1. Strengthen digital skills training

The government should increase investment in digital skills training and set up a special training fund. For example, 10 billion yuan is allocated annually to support digital skills training projects. Encourage enterprises and social forces to participate in digital skills training, and provide tax incentives and other policy support to enterprises participating in training. For instance, enterprises that conduct digital skills training are eligible for tax exemptions, which are calculated based on a certain percentage of their training expenditures. Integrate various training resources, establish a national digital skills training platform, and provide rich online training courses to facilitate workers to learn anytime and anywhere.

Develop personalized training programs for different groups. For rural workers, basic digital skills training, such as computer operation and online shopping, is carried out to improve their cognition and application ability of digital technology. For the unemployed, carry out digital skills training that is closely integrated with market demand to help them achieve re-employment as soon as possible. For example, it provides popular digital skills training courses such as e-commerce operations and data annotation for the unemployed.

5.2. Promote industrial integration and innovation

To promote the digital transformation of traditional industries, the government has introduced industrial policies to guide traditional industries such as manufacturing, agriculture, and services to increase the application of digital technology. For example, financial subsidies, loan discounts and other support will be given to enterprises undergoing digital transformation. Encourage enterprises to carry out projects such as intelligent manufacturing, smart agriculture, and intelligent logistics, and create more jobs through digital transformation. For example, financial subsidies should be provided to enterprises implementing intelligent manufacturing projects, with the subsidy amount calculated as a certain proportion of the project investment scale.

Cultivate emerging industries in the digital economy and increase support for emerging industries such as artificial intelligence, big data, cloud computing, and blockchain. Set up an industrial development fund to support the R&D and innovation of emerging industry enterprises, such as setting up a digital economy emerging industry development fund with a scale of 50 billion yuan. Through the development of emerging industries, more high-end jobs will be created and high-quality talents will be attracted.

5.3. Improve employment policies and regulations

The government should prioritize refining laws to clarify relationship criteria in new employment forms, clarify the standards for determining labor relations under new forms of employment, and protect the legitimate rights and interests of workers. For example, formulate special labor regulations for new forms of employment to clarify the rights and obligations of platform enterprises and workers. Establish and improve the social insurance system that adapts to new forms of

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employment, explore insurance methods suitable for platform economy practitioners, and increase their social insurance participation rate. For example, the social insurance subsidy policy for flexible employment personnel has been introduced to encourage platform economy practitioners to participate in social insurance.

Strengthen labor supervision and law enforcement, increase the investigation and punishment of illegal acts of enterprises, and protect the rights and interests of workers in terms of labor remuneration, rest and vacation, and labor safety. Establish a rapid labor dispute handling mechanism to improve the efficiency of labor dispute handling and protect the legitimate rights and interests of workers. For example, an online mediation platform for labor disputes has been set up to achieve rapid mediation and handling of labor disputes.

5.4. Narrowing the digital divide

The government allocates an annual fund of 20 billion yuan to digital infrastructure development projects—including network deployment and communication base station construction—in rural and remote areas, aiming to upgrade network access and hardware conditions in these regions. For example, the "broadband village" project will be implemented to achieve full coverage of broadband networks in rural areas by 2025.

Carry out digital literacy popularization activities to improve the digital literacy of workers in rural and remote areas. Popularize digital technology knowledge and application skills to workers in rural and remote areas through offline training and online courses. For example, organize volunteers to go deep into rural areas to carry out digital skills training lectures to improve the digital literacy and application ability of rural workers.

6. Conclusion

The rapid development of the digital economy has had a multifaceted impact on China's labor employment. On the one hand, the digital economy has created new jobs, improved employment efficiency and flexibility, and improved the quality and skills of workers; On the other hand, the digital economy has also caused structural unemployment, exacerbated employment inequality, and brought about the protection of workers' rights and interests. To address these impacts, measures need to be taken to strengthen digital skills training, promote industrial integration and innovation, improve employment policies and regulations, and narrow the digital divide. Through the implementation of these measures, this study can fully leverage the positive impacts of the digital economy on labor employment, mitigate its adverse effects, and ultimately facilitate the benign interactive development between the digital economy and labor employment. In the future, with the further development of the digital economy, it is also necessary to continue to pay attention to its impact on labor employment and adjust relevant policies in a timely manner to adapt to new changes.

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