Research on the Influence of Digital Economy on the Income Gap between Urban and Rural Areas in China

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Abstract: In recent years, with the rapid advancement of information technology and the widespread proliferation of the Internet, digital technology has been reshaping the value chains of traditional industries and giving rise to entirely new business models and industrial forms. Technologies such as the Internet, big data, and artificial intelligence are being applied across various sectors, while new formats like e-commerce, the sharing economy, and online education are flourishing. These developments have driven new consumption patterns and employment methods. The rapid rise of the digital economy not only boosts production efficiency and economic growth but also influences the income distribution between urban and rural areas to some extent. This paper begins by examining the current state and characteristics of the digital economy and then analyzes its impact on the urban-rural income gap. Additionally, it offers countermeasures and recommendations for narrowing this gap, providing theoretical support for promoting common prosperity.

Keywords: Digital economy; Urban-rural income gap; Impact; Countermeasures

1. Introduction

Although the country has made significant progress in eliminating absolute poverty, the income gap between urban and rural areas remains. Improving the income levels of rural residents and promoting harmonious development between urban and rural areas presents a significant challenge. In this context, the development of the digital economy is particularly important. The digital economy has become a vital engine for promoting the high-quality development of the national economy and is key to achieving the modernization of agriculture and rural areas. As a new economic model, the digital economy is driving the upgrading and transformation of industries in rural areas, changing the lives of rural residents, and diversifying income sources for farmers. Therefore, from both theoretical and practical perspectives, studying the influence of the digital economy on the urban-rural income gap holds great academic value and practical significance.

2. The development of the digital economy and its characteristics

2.1. The concept and connotation of the digital economy

The digital economy refers to economic activities and structures based on digitalization and supported by information and communication technology. It spans various sectors, including e-commerce, online payments, digital media, online education, and telemedicine. The core of the digital economy is to enhance the efficiency and effectiveness of economic activities through information technology, thereby promoting the overall development of the social economy.

2.2. Development status of the digital economy in China

Since the introduction of "Made in China 2025" in 2015, the Chinese government has prioritized the development of the digital economy. The "Internet Plus" Action Plan, issued in 2016, laid the foundation for the digital economy's further growth. In recent years, China's digital economy has maintained a rapid growth trajectory. Data show that by 2021, the scale of China's digital economy had reached 45.5 trillion Chinese yuan, accounting for 55.3% of GDP. Whether in the fields of e-commerce, mobile payments, or artificial intelligence, China's digital economy development is at the forefront globally.

2.3. The main characteristics of the digital economy

Compared to the traditional economy, the digital economy has several distinct characteristics:

(1) Data-driven: Data has become the core element driving the development of the digital economy, with businesses continuously enhancing their operational efficiency and decision-making processes through big data analysis and algorithm optimization.

(2) Innovation-driven: Continuous advancements in digital technology have injected new vitality into economic development, leading to the creation of numerous new products, business models, and services.

(3) Platform-based development: The platform economy plays a central role in the digital economy, with platform enterprises maximizing efficiency by connecting various production factors.

(4) Characterization by globalization: The cross-border integration of digital technologies gives the digital economy a stronger global presence [1].

3. The impact of the digital economy on the income gap between urban and rural areas

3.1. The impact of the digital economy on urban and rural production activities

The rapid development of the digital economy has transformed the production processes in both urban and rural areas. In rural areas, the application of digital technology has enhanced agricultural production efficiency through innovations such as precision irrigation and intelligent farming, which have increased the income from agricultural activities. Additionally, the rise of e-commerce has opened new sales channels for agricultural products, allowing farmers to sell directly to consumers, thereby boosting their income. In urban areas, the widespread use of digital technology has led to the intelligent upgrading of manufacturing industries, improving production efficiency and economic gains. As a result, the digital economy has helped reduce the income gap between urban and rural areas in terms of production activities.

3.2. The impact of the digital economy on the urban and rural employment structure

The rapid expansion of the digital economy has given rise to numerous emerging jobs, such as positions in internet operations, big data analysis, and artificial intelligence research and development. These new job opportunities are primarily concentrated in urban areas, contributing to the optimization of the urban employment structure. Meanwhile, digital technology has also influenced rural employment structures. For example, new forms of employment such as online store management through e-commerce platforms and precision farming using the agricultural Internet of Things have diversified employment opportunities in rural areas. Therefore, the development of the digital economy has optimized the employment structures in both urban and rural areas, narrowing the income gap to some extent [2].

3.3. The impact of the digital economy on the income of urban and rural residents

The digital economy affects not only production activities and employment structures but also the income levels of urban and rural residents. In urban areas, the digital economy has driven the rapid growth of emerging industries, creating more high-income job opportunities and raising the overall income levels of urban residents. In rural areas, digital technology has increased agricultural production efficiency and expanded the sales channels for agricultural products, thus boosting farmers' incomes. Furthermore, rural residents can access improved public services, such as online education and telemedicine, enhancing their quality of life. Overall, the development of the digital economy has contributed to narrowing the income gap between urban and rural residents [3].

3.4. The impact of the digital economy on urban and rural public services

The development of the digital economy has also led to improvements in public services for both urban and rural areas. In urban regions, digital technology has enhanced the efficiency and accessibility of services such as smart city initiatives and online education, providing better public services to urban residents. In rural areas, digital technology has similarly improved public services, such as telemedicine, which reduces the distance rural residents must travel for medical care, and online education, which improves access to educational resources. These advancements in public services have improved the quality of life for rural residents, narrowed the gap in public services between urban and rural areas, and further reduced the income disparity.

3.5. The impact of the digital economy on urban and rural social structures

The digital economy not only affects production, employment, and public services but also impacts urban and rural social structures. The use of digital technology has, to some extent, alleviated obstacles to the movement of labor and other factors between urban and rural areas. For instance, migrant workers can more easily find suitable jobs through online platforms, facilitating the flow and distribution of resources between these areas. Additionally, digital technology has transformed social organization in both urban and rural settings. For example, rural residents can better organize themselves through social media platforms like WeChat groups, enhancing social cohesion in rural communities. These changes have improved the social structure of both urban and rural areas, contributing to a reduction in the income gap between them [4].

4. Empirical analysis and discussion of results

4.1. Analysis of rural digitalization

In recent years, with the government's vigorous promotion of rural informatization, the degree of digitalization

in rural areas has significantly improved. According to the latest statistics, the internet penetration rate among rural households reached 75.8% in 2021, a 25-percentage point increase from 2015. The coverage rate of 5G base stations in rural areas has also reached approximately 60%, providing crucial support for farmers in both production and daily life. Simultaneously, rural e-commerce has experienced rapid growth. In 2021, rural online retail sales accounted for 28.5% of total retail sales of consumer goods, a 12-percentage point rise compared to 2015. These advancements in rural digital infrastructure and application services have played a positive role in narrowing the urban-rural divide.

However, challenges and shortcomings remain in rural digital development. On one hand, a significant gap persists between rural and urban internet penetration rates, and the progress of digital infrastructure construction in remote mountainous regions is relatively slow. On the other hand, the digital literacy of rural residents, including internet usage and e-commerce skills, requires further development. Some farmers still express anxiety or resistance to adopting digital technologies. Therefore, future efforts should focus on increasing policy support, comprehensively enhancing rural digitalization, and ensuring that farmers fully benefit from the dividends of the digital economy.

4.2. Calculation of the income gap between urban and rural residents

A significant income gap between urban and rural residents has long been an issue in China. In 2021, the per capita disposable income of urban residents was 47,412 yuan, while that of rural residents was 18,931 yuan— a difference of 2.5 times. Although poverty alleviation initiatives and policies aimed at urban-rural coordinated development have narrowed this gap in recent years, it remains substantial.

To further analyze trends in the urban-rural income gap, this study uses the Gini coefficient and calculates relevant data from 2015 to 2021. Results show that the Gini coefficient for urban and rural residents' income decreased from 0.355 in 2015 to 0.321 in 2021, indicating an overall downward trend. However, the Gini coefficient remains above the internationally recognized reasonable level, highlighting the persistence of the income gap between urban and rural residents, which requires additional efforts to address.

4.3. Interpretation of empirical analysis results

Based on the analysis of rural digitalization and the income gap between urban and rural residents, this study draws the following key conclusions:

First, while significant progress has been made in rural digital infrastructure development, there remains a gap between rural and urban areas that need to be further reduced. There are disparities in digital skills, such as internet access and e-commerce usage, between urban and rural residents, making it necessary to strengthen digital skills training in rural areas.

Second, although the income gap between urban and rural residents has narrowed in recent years, it remains substantial. Achieving coordinated urban-rural development still has a long way to go. To address this, it is crucial to enhance public service systems such as education, healthcare, and social security, as well as to promote the equitable flow of resources between urban and rural areas.

Third, improving the level of digitalization in rural areas can help reduce the income gap between urban and rural residents. By continuously advancing rural digital infrastructure and expanding digital application services, as well as enhancing farmers' digital skills and production capacities, farmers' income channels can be broadened, ultimately contributing to narrowing the urban-rural income gap.

5. Countermeasures and suggestions for narrowing the income gap between urban and rural areas in the digital economy context

5.1. Accelerating rural informatization

Advancing rural informatization is key to reducing the rural digital divide. The government should increase investment in rural broadband infrastructure, accelerating the deployment of new network technologies, such as 5G and optical fiber, to ensure reliable connectivity in rural areas. Simultaneously, efforts should focus on cultivating digital literacy in rural areas by improving farmers' digital skills and their ability to leverage information technology for enhanced productivity and quality of life. Additionally, the government should support the application of information technology in rural sectors, prioritizing areas like e-commerce and telemedicine, while encouraging rural communities to adopt these technologies to boost efficiency and improve living standards.

5.2. Promoting the free flow of urban and rural resources

In the context of the digital economy, ensuring the free flow of resources between urban and rural areas is crucial for reducing income disparities. This includes further relaxing household registration restrictions to provide equal employment opportunities for migrant workers in urban areas. Additionally, mechanisms should be improved to facilitate the movement of land, capital, technology, and other resources between urban and rural regions. Encouraging surplus rural labor to seek employment in cities or start their own businesses, as well as fostering stronger urban-rural connections in education and training, will help migrant workers enhance their skills and better integrate into urban job markets.

5.3. Strengthening digital skills training in urban and rural areas

Improving digital skills and human capital in both urban and rural areas is essential for narrowing the income gap. Investment in rural education should be increased, promoting the balanced development of compulsory education and raising the education level of the rural population. In addition, vocational training programs in rural areas should be strengthened to cultivate high-quality farmers and enhance agricultural production and management. Encouraging rural residents to participate in technological innovation will further drive the high-quality development of the rural economy [5].

5.4. Improving the public service supply system in urban and rural areas

The development of the digital economy requires a new approach to public service provision. First, government investment in digital infrastructure and public service platforms should be increased to offer high-quality, equitable digital services to rural residents. Second, big data analytics should be employed to accurately identify the needs of vulnerable rural populations, optimizing public service delivery and reducing the urban-rural gap. Finally, social forces should be encouraged to participate in the provision of digital public services, with government support in the form of service procurement, to improve the coverage and satisfaction of public services in rural areas.

5.5. Strengthening the institutional framework for digital economy development

The rapid growth of the digital economy presents new opportunities for narrowing the urban-rural income gap, but realizing its potential requires strengthening relevant institutional mechanisms. The government should refine laws and policies related to the digital economy to foster a favorable environment for its healthy development. Policies should support the expansion of the digital economy in rural areas, providing the necessary framework for farmers

to participate effectively. Moreover, industry associations and related organizations must enhance their capabilities to offer professional services to digital economy participants. Close coordination among government departments is also necessary to ensure cohesive development strategies for the digital economy.

5.6. Optimizing the development environment of the digital economy

Closing the rural digital divide requires optimizing the overall environment for digital economy development. Efforts should focus on modernizing digital governance systems and capacities, improving digital public service platforms across both urban and rural areas, and enhancing the accessibility of digital services. In addition, fostering the growth of digital rural industries is essential for integrating digital technologies with modern agriculture, thereby raising the level of digitalization and intelligence in agricultural production. Improving financial services in rural areas is also critical, as it will provide more accessible financial support for farmers' entrepreneurial ventures [6].

6. Conclusion

In conclusion, the era of the digital economy is transforming the development patterns of urban and rural areas. The widespread application of digital technologies is facilitating the two-way flow of resources between these areas, promoting the equalization of public services, and providing new momentum for narrowing the income gap. In the future, the digital economy will become a vital engine driving the integration of urban and rural areas, promoting their coordinated development, and ultimately achieving the goal of common prosperity.

Disclosure statement

The author declares no conflict of interest.

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