

A Literature Review on the Impact of the Digital Divide on Residents' Income Gap

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Abstract

Under the leadership of the Communist Party of China (CPC), China has successfully accomplished the task of poverty alleviation as scheduled, eradicating absolute poverty in rural areas, and has now entered a new stage of comprehensively advancing rural revitalization. The 20th National Congress of the CPC pointed out that "common prosperity is an essential requirement of socialism with Chinese characteristics, and the most arduous and onerous task in building a modern socialist country in an all-round way still lies in rural areas." At present, China's policies are gradually shifting toward raising the income level of rural residents, enhancing their sense of well-being, and continuously improving their quality of life, striving to push the development of the rural economy to new heights. With the continuous development and transformation of network information technology, the digital economy has not only spawned new social trends but also brought about the issue of the digital divide among Chinese residents. Due to differences in the level of access to and use of network information in rural areas, the income distribution gap caused by the digital divide is gradually widening. Rural residents in China are at a disadvantage compared with urban residents in terms of access to network information technology resources; furthermore, the network information technology resources held among rural residents themselves are also fragmented, making the problem of the digital divide they face quite severe. Therefore, at this stage, how to bridge the digital divide and alleviate the imbalance in income distribution among rural residents has become a key part of realizing social equity, advancing rural revitalization, and safeguarding the achievements of poverty alleviation. Eliminating the digital divide, promoting the income growth of rural residents, and narrowing the income gap among them will help rural residents better engage in the historical process of realizing the great rejuvenation of the Chinese nation.

Keywords

Digital divide; Rural residents; Income gap; rural revitalization; common prosperity

1. Introduction

In August 2024, the China Internet Network Information Center (CNNIC) released the

54th Statistical Report on Internet Development in China at the "Smart Economy Innovation and Development" exchange event of the 2024 China International Big Data Industry Expo. The Report shows that as of June 2024, the scale of China's netizen population had reached nearly 1.1 billion (1.09967 billion), an increase of 7.42 million compared with December 2023, and the Internet penetration rate stood at 78.0%. In the first half of 2024, China's Internet industry maintained a sound development momentum: the foundation of Internet infrastructure was consolidated to underpin development, digital consumption stimulated the potential of domestic demand, digital applications unleashed innovative vitality, and more people gained access to the Internet, sharing the convenience and dividends of the digital era. The vigorous development of the Internet has transcended the constraints of time and space, bringing substantial convenience to people's daily lives; driven by the Internet, the digital economy has become the most critical, rapidly growing, and prominent force in the field of economic development.

The 20th National Congress of the Communist Party of China (CPC) pointed out that "Chinese-style modernization is the modernization of common prosperity for all people" and that "common prosperity is an essential requirement of socialism with Chinese characteristics, and the most arduous and onerous task in building a modern socialist country in an all-round way still lies in rural areas." According to data from the National Bureau of Statistics, the per capita disposable income of high-income rural households was 7.41 times that of low-income rural households in 2013; this ratio expanded to 8.46 times in 2019 and further to 9.95 times in 2024. This indicates that the income gap among rural households in China is relatively severe, and narrowing this gap is an urgent task. With the advent of the digital economy era, while the digital economy has brought considerable convenience, it has also exposed many issues that cannot be ignored. The heterogeneous diffusion of digital technology fails to benefit all residents—some groups, due to backward information technology, are unable to enjoy the digital dividends brought by the development of the digital economy, thereby objectively giving rise to the "digital divide" problem.

The existence of the digital divide places numerous obstacles in the way of digitally disadvantaged groups seeking to access the dividends of the digital economy, making it difficult for them to seize opportunities in the era of rapidly developing digital information. As an unfair phenomenon at the digital level, the digital divide is not conducive to rural residents' efforts to start businesses and increase income, hinders the improvement of residents' sense of well-being, seriously impedes the development of the digital economy, and restricts high-quality economic development. This inequality has led to a huge income gap among residents and undermined the great goal of solidly advancing common prosperity for all people [1]. General Secretary Xi Jinping pointed out that "we should fully implement the strategy of making China a cyber power" and "narrow the digital divide, safeguard and improve people's well-being in the development of the Internet, and let more countries and people share the achievements of Internet development"—these remarks provide guidance for bridging the digital divide, increasing rural residents' in-

come, and reducing the income gap among rural residents caused by the digital divide. As an element of digital inequality, the digital divide exerts a far-reaching impact on the income gap. How it affects the income gap among rural residents and how to eliminate the digital divide among rural residents to alleviate income inequality deserve in-depth consideration. Studying the impact and mechanism of the digital divide on the income gap among rural residents is of great significance for increasing rural residents' income, ensuring the steady growth of rural residents' income and stable agricultural production, and comprehensively advancing rural revitalization. Bridging the digital divide also plays an important role in alleviating poverty, preventing large-scale return to poverty, avoiding polarization in rural areas, and realizing common prosperity.

2. Review of Research on Income Disparities

2.1. Review of Research on Urban-Rural Income Disparities

As a key component of the income gap among residents, the income disparity between urban and rural residents has been the subject of extensive research by scholars. Since the reform and opening-up, China has achieved remarkable social and economic development, with significant increases in both total economic output and per capita income; however, problems such as uneven urban-rural income remain severe, manifested in the continuously widening absolute income gap between urban and rural residents. The long-standing dualistic system in China prevents the free flow of production factors between urban and rural areas. Additionally, because government policies and resources heavily favor cities, development between urban and rural areas becomes unbalanced, which in turn leads to income disparities—the urban-rural income gap. The disparities between urban and rural areas stem from differences in modes of production: urban regions mainly rely on manufacturing and services, whereas rural regions mainly rely on agriculture and animal husbandry. These differences in production methods inevitably result in income gaps between urban and rural areas. Urban residents earn significantly more than rural residents, and China's urban-rural income gap has shown a trend of continuous expansion. Regarding the income gap between urban and rural residents, the contribution of wage incomes and transfer payments to the income gap has been continuously decreasing, while the contribution of property income to the urban-rural income gap has been rising, becoming the greatest hidden risk for widening the urban-rural income gap. However, blindly expanding the scale of fiscal expenditure at this stage is not advisable, since current fiscal spending in China does not favor narrowing the urban-rural income gap[2]. Local governments overly prioritize economic growth, and in terms of public services and fiscal expenditure, policies clearly favor urban areas, which widens the income gap between urban and rural residents. Today, to improve the urban-rural income gap, it is necessary to optimize the urban-rural industrial structure, improve the efficiency of economic resource allocation between urban and rural areas, and promote the free flow of production factors

between urban and rural regions, thereby narrowing the urban-rural income gap and achieving common prosperity for all citizens.

2.2. Overview of Urban Residents' Income Disparities

As one of the factors affecting income disparity, the income gap among urban residents has received widespread attention from scholars. With the economy continually entering new stages and rapid urbanization, the larger the population size and the higher the density of a city, the faster the income growth of high-income earners, thereby widening the gap with low-income earners[3]. However, the issue of income disparity among urban residents has become increasingly severe. The income gap among urban residents mainly includes disparities among residents in different towns within the same region, disparities among residents in different regions, and disparities among residents within the same industry. Urbanization affects the income disparity of urban residents; some scholars believe that urbanization is the main cause of income disparity among urban residents. Urbanization promotes income distribution differences through its impact on human capital levels and financial development, which in turn facilitates industrial upgrading and leads to income gaps. The urbanization process further promotes urban agglomeration and industrial restructuring, thereby forming regional urban income disparities. At the same time, institutional changes also affect the income disparity of urban residents. Some scholars believe that the primary causes of urban income disparity are macroeconomic system reforms and industry gaps, and adjustments in industrial structure can also negatively impact income inequality. A review of the literature on income disparity among urban residents reveals a negative correlation between economic growth and income gap; income disparity among urban residents is also related to factors such as the household registration system, gender, occupation, age, and skill proficiency.

2.3. Overview of Rural Residents' Income Disparities

As an important influencing factor of the income gap among residents, the income disparity among rural residents is also the main focus of this article and has attracted considerable attention from many scholars, who have conducted extensive research on the topic. Some scholars believe that the income gap among rural residents is the main driving force behind the persistently high income disparity in China. Over the past few decades, the income gap among rural residents in China has remained at a relatively high level and has shown a gradually increasing trend. In terms of rural residents' income gap, the gap in wage income is the most significant, while the gap in operational income has been steadily expanding[4]. Although the Gini coefficients of operational and wage incomes are relatively low, since these two types of income account for more than 80% of rural residents' income, their contribution to the overall rural income gap is higher than that of property income and

transfer income. Factors affecting the income gap among rural residents can be considered from both macro and micro perspectives. At the macro level, the first factor is the different resource endowments possessed by rural residents, which is one of the reasons influencing the income gap, and the income gap among different villages is also affected by their respective resource endowments. The second factor is the tilt in government policies across regions. After the reform and opening-up, the eastern coastal regions, due to their advantageous geographical location, strong economic foundation, and higher levels of culture, education, and technology compared to the central and western regions, received more policy support and achieved higher levels of economic development, thus widening the income gap among rural residents in the eastern, central, and western regions. The third factor is infrastructure construction. The structural imbalance between the supply and demand of traditional infrastructure may negatively affect the economic output and ecological environment in economically less developed regions[5], thereby widening the rural income gap. Compared with traditional infrastructure, network infrastructure has a wider and faster range of information dissemination, and its popularization may help alleviate the rural income gap to some extent. At the micro level, the first factor is educational resources, which affect the income gap among rural residents. Government expenditure on education helps increase both the years of schooling and income, especially for low-income groups such as rural residents, thereby reducing the income gap[6]. The second factor is the non-agricultural income of rural residents. Unequal distribution of non-agricultural income is a key factor that exacerbates income differences within rural areas. Scholars have found that high-income non-agricultural industries increase income inequality within rural areas, while low-income non-agricultural industries help alleviate this inequality. In summary, based on both macro and micro-level studies, the trend of income disparity among rural residents in China is not merely persistently high but is influenced by many complex factors, showing diverse patterns of change. Addressing the issue of narrowing the rural income gap remains an urgent task.

3. Review of Research on the Digital Divide

3.1. Review of Theoretical Research on the Digital Divide

In the early research on digital divide theory, scholars believed that the digital divide should be considered a multidimensional phenomenon related to social, cultural, and resource factors, requiring corresponding qualitative and dynamic studies to ensure that the digital divide issue receives sufficient attention[7]. The digital divide arising from differences in the ownership, skills, and applications of information and communication technologies (ICT) has a significant impact on education, age, and income and can also exacerbate income distribution disparities. The gap in ICT adoption among countries and regions causes slower information dissemination in developing countries, thereby continuously widening the digital divide[8]. At the

national level, the gap in ICT adoption between developed and underdeveloped countries is evident. Scholars have studied many issues at the level of developed countries, seeking evidence of the digital divide, identifying its causes, evaluating strategies to reduce it, and exploring strategies in developing countries, strategies to narrow the international digital divide, and the role of libraries in bridging the national and global digital divide[9]. For enterprises, the digital divide between small and medium-sized enterprises (SMEs) and large companies indicates that efforts to bridge the SME digital divide should focus on overcoming internal obstacles in 'skills acquisition' and 'usage acquisition.' The digital divide refers to the phenomenon where some people cannot access essential goods, information, or services necessary for normal social functioning through ICT means, rather than material obstacles, indicating that the digital divide is a negative issue brought about by the development of the digital economy, seriously hindering the process of rural common prosperity[10]. In daily life, the digital divide is both a manifestation of digital inequality, and most inequalities in digital technology are more relative, with research expanding from digital exclusion to social exclusion, demonstrating that digital technologies do indeed improve people's daily activities. As research on the digital divide deepens, scholars have used Weber's stratification theory to construct different layers of the digital divide, explored the extent to which digital media expands or reinforces the digital divide, and proposed specific theories on the third-layer 'use-gap' within the digital divide[11]. This theory is used to explain the concept of digital capital and provides a feasible theoretical reference for the utility gap, suggesting that different forms of the digital divide can exacerbate inequalities within society, as the digital divide can limit or enhance citizens' social and economic capital and their ability to participate in society[12].

With the rapid development of the digital economy, scholars have further expanded research on the digital divide. They have pointed out the concept of stratification in the digital divide and the inequality in digital domains, clarifying that the digital divide merely extends traditional forms of inequality. From Weber's stratification theory, the issue of digital inequality leading to the digital divide is understood as not only affecting economic aspects but also impacting people's social lives [13]. Scholars have explored the limitations of the two determinants of the digital divide, suggesting that research on the digital divide is largely confined to socio-demographic and socio-economic determinants. Nowadays, the focus of digital divide policies has shifted to skill and usage acquisition, yet incentives and material acquisition remain relevant. They are necessary throughout the process of internet adoption, and digital divide policies should simultaneously address material, skill, and usage acquisition issues [14]. Petya and others have leaned towards research at the micro level, exploring the digital divide by examining phenomena at the individual level and developing a conceptual model UTAUT2 to gain a deeper understanding of the drivers influencing technology adoption at the individual level. Gon-

calves, based on the extended Unified Theory of Acceptance and Use of Technology (UTAUT2), proposed a new theoretical model to explore the values of ICT acceptance, and on this basis, studied how to explain the digital divide at the individual level. The study found that the existence of the digital divide has created a group of information-vulnerable populations, hindering these groups from fully leveraging the opportunities brought by information technology to participate in social life [15].

3.2. Empirical Research Review on the Digital Divide

Since the NTIA proposed the concept of the digital divide in 1995, scholars have believed that the formation of the digital divide is influenced by multiple factors. A substantial amount of empirical research on the digital divide has been carried out on both macro and micro levels to explore its main causes. The digital divide is commonly defined as the gap between those who can and cannot use information and communication technologies. However, as research on the digital divide has deepened, scholars believe this understanding is narrow. Today, the digital divide is summarized into three dimensions: the first-level digital divide, or access divide, represents the initial manifestation; the second-level digital divide, or usage divide, is a more commonly recognized definition; and the third-level digital divide, or benefit divide, has attracted attention on the basis of the first two levels. At the macro level, scholars argue that the digital divide across different regions and countries is mainly influenced by political, economic, and cultural factors[16]. The level of economic development, investment in research and experimental development, and educational development are key factors in the digital divide between countries and regions. Additionally, the level of digital economy development, knowledge development, and information infrastructure construction are important factors affecting internet penetration. Social capital differences, cultural differences, and differences in social systems also affect the formation of the digital divide. At the micro level, scholars believe the formation of the digital divide is mainly influenced by individual and household factors, such as personal education level, income, age, gender, and risk attitude; household labor proportion, economic status, and proportion of elderly population, among others. Education level and income are among the most important factors causing the digital divide. People with higher education levels can operate complex digital technologies more easily, and those with higher incomes can access advanced digital technologies more quickly[17]. Older people are more likely to face digital divide issues compared to younger people. The digital divide appearing among the elderly results from insufficient opportunities to access or use information infrastructure and low levels of digital literacy, and policies should be actively proposed to bridge the digital divide for the elderly.

4. Literature Review on the Impact of the Digital Divide on Rural Residents' Income Gap

4.1. Literature Review on the Impact of the Digital Divide on the Urban-Rural Income Gap

In research on the digital divide and income disparities between urban and rural residents, many scholars explore the mechanisms through which the digital divide hinders the economic development of urban and rural residents by analyzing the relationship between the digital divide and income gaps[18]. They investigate how, in today's highly developed digital economy, the digital divide gradually widens the wealth gap between urban and rural residents. Scholars use the Gini coefficient and Theil index at the macro level to further measure income disparities, introducing variables such as the ratio of urban to rural wage income, the ratio of urban to rural net operating income, and the ratio of urban to rural total income for heterogeneous analysis. Unique indicators are used to measure the access divide and usage divide: the ratio of broadband access in urban areas to agricultural broadband access reflects the primary digital divide, while the ratio of years of education between urban and rural residents reflects the secondary digital divide. At the same time, research has found that improving rural residents' use of digital resources and enhancing rural digital infrastructure helps narrow the income gap between urban and rural areas. In the early stages of digital economy development, urban-rural income gaps may decrease, but further uneven development of the digital economy can widen these gaps, leading to digital divide issues. Government policies promoting digital economy development can help bridge the digital divide and reduce income disparities between urban and rural residents. Scholars have also examined the characteristics and influencing factors of the Chinese urban-rural digital divide at the internet level, noting that there is a significant digital divide between urban and rural areas in China, though it shows a declining trend during the study period[19]. The urban-rural digital divide varies significantly among different populations, especially for those with poor health, older age, low income, and low education levels. Such research helps in scientifically understanding the inherent changes in the current Chinese urban-rural digital divide and emphasizes the importance of considering urban-rural differences in addressing its impacts.

4.2. A Review of the Impact of the Digital Divide on Rural Residents' Income Gap

Based on research on the impact of the digital divide on the income gap between urban and rural residents, this study delves into how the digital divide affects income disparities among rural residents. Numerous scholars have approached this issue using micro-level family data to explore how the digital divide influences rural residents' income and causes income differences. They also examine the impact of the digital divide on rural income gaps from an empirical research perspective to enhance theoretical persuasiveness and provide theoretical and empirical support for addressing household digital divides in China[20]. Some scholars have investi-

gated the causal relationship and intrinsic mechanisms between agricultural information services provided by information and communication devices and farmers' sales prices, mainly focusing on access and usage gaps. They suggest that improving farmers' ability to obtain effective information and narrowing primary and secondary digital divides is essential for enhancing farmers' welfare, and they have effectively distinguished among levels of the digital divide. The impact of the rural digital economy on rural residents' income is primarily reflected in the three-tier digital divide characterized by income growth and income gaps, suggesting that digital inequality leads to and exacerbates income inequality. Some scholars have examined the influence of the digital economy on rural income disparities from the perspectives of digital dividends and the digital divide, noting that the effect of the digital divide in widening income disparities is more pronounced in rural areas with medium and high wealth levels, low old-age dependency ratios, and in the eastern regions. To prevent the digital divide from causing income imbalances, scholars analyze the impact of the digital economy on income disparities by combining the concepts of the digital divide and digital dividends, suggesting that they exhibit opposite effects on rural residents' income gaps[21].

5. Summary

This article systematically reviews the literature on the impact of the digital divide on income disparities among residents, with a particular focus on the core issue of income disparities in rural areas. It clarifies the core perspectives and frameworks of existing research from three dimensions: income disparity, the digital divide, and the relationship between the two. At the level of research on the connection between the digital divide and income disparities, existing findings reveal the complexity and differentiation of their effects: Regarding urban-rural income disparities, the digital divide widens the gap through unequal access and differences in usage capabilities, while strengthening rural digital infrastructure and improving the utilization of digital resources can effectively bridge the divide. Moreover, government policies guiding the digital economy can mitigate the negative effects of the divide. In terms of rural residents' income disparities, research has extended from the primary and secondary divide of 'access-usage' to the tertiary divide of 'income impact,' confirming that digital inequality amplifies income inequality. This effect is particularly pronounced in rural areas with middle-to-high wealth, eastern regions, and areas with low elderly dependency ratios. Additionally, digital dividends and the digital divide exhibit 'reverse effects' on income disparities, necessitating policies that balance the two to prevent income imbalance. In summary, existing research has established an analytical framework for the digital divide and residents' income disparities, but there remains room for further exploration: First, there is insufficient research on the dynamic evolution of the rural digital divide; second, the micro-level mechanisms through which the digital divide affects rural residents' in-

come disparities have not been thoroughly investigated; third, there is limited research on the differences in the digital divide among various rural groups and on the adaptability of policies. Future research could focus on these directions to provide more precise theoretical support and policy guidance for bridging the rural digital divide, reducing income disparities, and promoting rural revitalization.

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