

Research Progress of High-Quality and Equilibrium Economic Development of Ethnic Regions in the Context of Digital Economy

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Abstract: A new generation of information technology is driving the growth of digital economy across the world. In recent years, China has attached great importance to the development of digital economy and digital technology. With the support of a series of policies, the digital industry has been able to develop at an astounding rate, and at the same time the integration of other industries with digital technology has been strengthened. The profound changes in production factors, production methods, and production approaches have promoted high-quality regional economic development. Literature statistics have shown an increasing trend in digital economy research in recent years. In this paper, literature on digital economy development, digital economy and high-quality economic development, the current situation of economic development in ethnic regions, and digital economy and economic development in ethnic regions is recapitulated in an attempt to learn from existing studies.

Keywords: Digital economy; High-quality development; Regional economy; New era

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1. Introduction

With the continuous development and iteration of digital technologies, such as big data, artificial intelligence, and cloud computing, a new round of technological innovation with digitalization, networking, and intelligence as the core is providing a constant source of momentum for economic recovery across the world. The difference between the digital economy led by the new generation of information technology and the previous technological revolutions is that the new round of technological revolution is not the change of a single technology, but rather the integration of a series of technologies as well as the “digitalization of industry” and “digital industry” generated by the intersection of multiple technologies for development. The “digitalization of industry” and “digital industry” generated by the interplay of multiple technologies will definitely have a profound impact on human production and life.

For a long time, China has attached great importance to the development of digital economy and digital technology and stressed the need to continuously strengthen and expand its own digital economy. In 2016, China stressed the need to expand and strengthen digital economy as well as expand the space for economic development. In the same year, an initiative to develop digital economy was put forward in the G20 Summit. In 2017, the acceleration of building a digital China and a digital economy with data at its core as well as promoting the integrated development of real economy and digital economy was stressed. In 2018, at the Central Economic Work Conference, emphasis was placed on the construction of 5G, artificial intelligence,

industrial internet, and other new infrastructures; it was then that the “new infrastructure construction” was proposed for the first time. In 2020, the strengthening of the “new infrastructure” was included in the government work report. In a congratulatory letter to the Wuzhen Summit of the World Internet Conference in 2021, it was pointed out that it is necessary to stimulate the vitality of digital economy, enhance the effectiveness of the digital government, optimize the digital social environment, build a pattern of digital cooperation, build a digital security barrier, and allow the digital civilization to benefit people around the world ^[1]. In the president’s keynote speech at the opening ceremony of the Boao Forum for Asia Annual Conference 2022, he stated that China will actively promote its accession to the Digital Economy Partnership Agreement ^[2]. The Chinese government has rolled out a series of policies to promote the development of China’s digital economy and achieve its digital development goals. With the development of digital technology and its infrastructures in addition to the continuous integration of digital technology with the economic industries of each region, the production factors and production methods that drive the economic development in each region will change dramatically. The digital economy is still in its early stages of development, and its impact on the world’s competitive landscape and economic development has been anticipated; however, the breadth and depth, content, and manner of its impact have yet to be established due to differences in regional folk culture, economic environment, and infrastructure. Therefore, in the context of digital economy, based on the construction and application of new digital infrastructures in ethnic regions and in consideration of the current economic level and development status of each ethnic region, ethnic society, and culture, sorting out literature on the high-quality and equilibrium economic development of ethnic regions will provide important insights and ideas for subsequent research.

2. Outlines of the development of digital economy

Modern computing technology did not begin with the internet; instead, it emerged in 1945 from the commercialization of technologies developed during World War II ^[3]. Computing technology in its initial stages focused on the speed of computation, and its ability to store and retrieve information was limited. By the early 1950s, magnetic core memory enabled efficient digital information storage. Over time, improvements in storage technology, software, and hardware allowed information processing and retrieval to become a commonplace. Software and hardware industries began to grow rapidly ^[3,4]. In the early 1990s, the privatization of computing technology in the United States led to the emergence and rapid spread of commercial internet. 1995 saw the publication of Tapscott’s book “The Digital Economy” and the introduction of the concept of “digital economy,” which argued that future economic activities would be widely represented in digital form and that digital management will greatly improve productivity. Castells, a professor at the School of Communication at the University of Southern California in Los Angeles, published a trilogy titled “The Information Age: Economy, Society, and Culture,” while Negroponte, a professor at the Massachusetts Institute of Technology, published a monograph titled “Digital Survival,” which offered the world an initial understanding of digital economy.

From 2004 to 2007, the world economy achieved rapid and steady growth, and the world’s gross domestic product (GDP) grew at an average annual rate of about 5%, with the highest in the past 30 years. The 2008 global financial crisis hit the traditional financial industry hard but had little impact on digital enterprises, such as Apple and Google; following that, digital enterprises such as Baidu and Tencent emerged in China. In 2016, a new interpretation of digital economy was introduced in the G20 Summit, defining it as “a series of economic activities that use digital knowledge and information as key factors of production, modern information networks as important carriers, and information and communication technology (ICT) as an impetus for efficiency improvement and economic structure optimization ^[5].”

In academia, research on digital economy significantly increased in 2021, jumping into the top 10 research hotspots ^[6]. In 2022, the National Committee of the Chinese People’s Political Consultative

Conference (CPPCC) held a special consultation on “promoting the sustainable and healthy development of the digital economy,” advocating new economic forms in which the digital economy would undoubtedly play a significant role.

3. Digital economy and high-quality economic development

Changes in key factors of production are the primary variables driving economic growth^[7]. The data factor rapidly decreases production cost, large-scale and unlimited supply, and universal application prospect, thus making it a typical key factor of production in the digital economy. The digital economy affects the factor input structure of industries through substitution and penetration effects and promotes economic growth by improving total factor productivity^[8]. The digital economy has become a new impetus and source of economic development for all countries, bringing profound changes to the economic and social development of countries around the world. Goldfarb *et al.*^[9] expressed that the intervention of information technology greatly reduces the search cost, replication cost, transportation cost, tracking cost, and authentication cost of data and information and has an impact on international economy, regional economy, and personal consumption habits.

In China, the digital economy has expanded the scope of social connectivity, promoted innovation and entrepreneurship, as well as created an environment for high-quality human capital performance. According to the National Bureau of Statistics, the network economy index, which represents the digital economy, grew the fastest from 2015 to 2020, contributing 81.70% to the total index growth in 2020, thus showing that the digital economy has become an impetus for China’s high-quality economic development.

In China Journal Full Text Database (CNKI) “advanced search,” the search criteria were set as “digital economy” and “high-quality economic development.” A total number of 265 articles were obtained from 2018 to 2022, and the number of articles per year was observed to be on the rise, as shown in **Table 1** below. With “digital economy” as the subject matter, 235 articles were found, and there were 153 articles on “high-quality economic development.”

Table 1. Number of articles with keywords “digital economy” and “high-quality economic development” in 2018–2022

Year	Number of literature (articles)
2018	14
2019	33
2020	60
2021	104
2022	127 (predicted volume)

A review of the above-mentioned literature revealed that most researchers affirm the positive effects of digital economy on high-quality economic development. These studies cover both theoretical studies on the theoretical logic, mechanism of action, and development path of digital economy that can drive high-quality development as well as empirical studies that have proven the original hypothesis that digital economy drives high-quality economic development and on the various characteristics of digital economy that have an impact on high-quality development.

In terms of constructing an indicator system of digital economy and its development, Wang *et al.*^[10] constructed an indicator system of development level from five dimensions: innovation, coordination, green, openness, and sharing. According to Tian *et al.*^[11], the high-quality economic development of each region is mainly reflected in the improvement of production efficiency and the coordinated development of urban

economy; thus, total factor productivity is taken as an important indicator to measure the level of high-quality development. Zhang *et al.* ^[12] constructed an evaluation index system of the development level of digital economy from two dimensions (industrial digitization and digital industrialization) using 22 three-level indicators.

In terms of the impact and mechanism of digital economy on high-quality economic development, Li ^[13] found that digital economy possesses certain characteristics, such as disruptive innovation and hyper-speed growth. According to Ren ^[14], the development of digital economy cultivates the mechanism and path of a new dynamic energy for China's high-quality economic development. Wang ^[15] pointed out that the digital economy has a significant role in enhancing the level of high-quality economic development. The digital economy contributes to China's economic development through the combined effects of digital infrastructure construction, digital industry development, and digital financial inclusion. Cui ^[16] proposed that digitalization can help accelerate the cultivation of the new dynamics of agricultural and rural growth as well as promote power change. Promoting digital industrialization and digitization of industries, growing digital economy and building digital countryside, as well as deeply integrating rural economy with digital economy are the core drivers of rural agricultural development and the key to high-quality agricultural and rural development. Using relevant data from 222 prefecture-level and above (including prefecture-level) cities in China from 2011 to 2016, Zhao *et al.* ^[17] constructed an indicator system of digital economy, high-quality development level, and enterprise entrepreneurial activity; their empirical analysis concluded that digital economy significantly promotes high-quality economic development.

From the above, it is clear that academics generally affirm the role of digital economy in fueling high-quality economic development, but it remains uncertain how long this impetus will give China's economy an edge.

4. Economic development of ethnic regions

According to the data of the Sixth National Population Census in 2010, the total population in China is 1.37 billion, of which 113 million are ethnic minorities, accounting for 8.49% of the total number of people in the country; the total land area of China is 9.6 million square kilometers, of which the area of autonomous regions of ethnic minorities accounts for 63.9% ^[18]. The ethnic regions in China have rich natural resources, unique geographical locations, and profound ethnic cultures. In China, ethnic development has always had a role in the stable development of its society, while economic development has been an important cornerstone to social stability in ethnic regions. In recent years, our government has analyzed the new problems, new situations, and new challenges encountered in the economic development of ethnic regions in China and deployed to solve the economic problems of ethnic regions by holding both central and local ethnic work conferences. The economic development of ethnic regions in China has grown at a remarkable rate.

Existing studies generally agree that the harsh natural environment is the most fundamental shackle of economic and social development in ethnic regions and that it interacts with demographic, economic, and social development, entailing poverty in ethnic regions. Zhang ^[19] pointed out that the overlap of physical capital, human capital, and social capital in poor regions weakens their ability to develop themselves. According to Zhang *et al.* ^[20], with the deepening of poverty alleviation and development in ethnic areas as well as the western region, the development of natural areas has entered a bottleneck, indicating that the advancement of poverty alleviation strategies is increasingly constrained by the natural space. According to Wan ^[21], one of the important factors of the emergence of persistent poverty, the return to poverty after poverty eradication, and the intergenerational transmission of poverty is the superficiality and short-term state of the anti-poverty strategy, which does not solve the problem of endogenous sustainable development in ethnic poor areas. He ^[22] pointed out that it is necessary to ensure that ethnic minorities are aware of their

own benefits in the process of economic development and complete the initial distribution and multiple distribution for ethnic minorities especially when the regional economic development has achieved significant results in order to balance the distribution of economic development benefits and stimulate their vision for development and initiative to participate. Wang ^[23] indicated that a series of unbalanced and inadequate development problems, such as insufficient endogenous development momentum, difficulty in increasing rural residents' income, insufficient labor force skill training, high resistance to urbanization, and the lack of environmental protection effect, have restricted the realization of people's growing needs for a better life in ethnic regions and fundamentally led to the lack of sustainable development in ethnic regions. In the new era, ethnic regions must adhere to anti-poverty strategies and ecological environmental protection, strive to achieve the "double carbon" goal, rely on local resource endowment, vigorously develop digital economy, clean energy, specialty agriculture, cultural tourism, and other green low-carbon advantageous industries, adhere to green revitalization, and support green low-carbon industries to promote high-quality economic development ^[24].

From the combing of literature, it is clear that the focus of research on the economy of ethnic regions in the new era has shifted from the survival of poor people in ethnic regions to how ethnic regions can achieve high-quality development through digital economy and how the fruits of development can be shared.

5. Digital economy and economic development of ethnic regions

In recent years, several studies on digital economy and regional economic development have shown that the intervention of digital technologies can redistribute income within regions, especially between urban and rural areas. Gaspar and Glaeser ^[25] showed that network interoperability can complement and substitute for urban effects and the intervention of the internet can increase labor mobility by making information about jobs outside the region more accessible to people in relatively disadvantaged areas. Forman *et al.* ^[26] pointed out that basic network connectivity can benefit remote and rural groups. However, they also argued that the dividends of digital economy are more likely to be accentuated in large urban areas, where the quality and quantity of online content are better and higher, respectively, and urban residents are more willing and likely to access the internet. At the same time, urban areas are more prone to agglomeration effects. Forman *et al.* ^[27] demonstrated in their study that businesses in large cities and large corporations use internet commerce to a greater extent. Aggregation effects can benefit cities, yet low-cost internet interventions can benefit remote groups. These two arguments are inconclusive.

Domestic studies on digital economy and regional economic development have demonstrated that the digital economy represented by information technologies, such as big data, cloud computing, and artificial intelligence, has become a new impetus for regional innovation development. Deng *et al.* ^[28] showed that geographical segmentation, industrial segmentation, cultural knowledge segmentation, and other factors inhibit the spillover of regional innovation efficiency and regional innovation effect. Ai *et al.* ^[29], on the other hand, used provincial panel data from 2011 to 2018 to analyze the direct and indirect poverty reduction effects of digital economy through channels of economic growth and income distribution. Chen *et al.* ^[30] analyzed the provincial and city-level data of Yangtze River Delta region and concluded that digital economy positively contributes to regional economic resilience in the long run at the provincial level, while the development of urban digital economy significantly strengthens urban economic resilience at the city level and indirectly strengthens urban economic resilience through spatial spillover and urban innovation capacity improvement.

Focusing on the ethnic areas in China, the inauguration of the National Rural Revitalization Administration in 2021 represented the starting point of the rural revitalization strategy implementation in China ^[31]. As the focus and challenge of rural revitalization in China, ethnic regions should strengthen their economic development and raise farmers' income ^[32]. According to Young ^[33], digital economy, through

the virtual space that bridges the “physical world” and the “digital world,” is a tool that supports the realization of agricultural production, rural circulation, social governance, lifestyle, and cultural concepts as well as a new means to support the comprehensive revitalization of rural areas. In the context of the digital era, Cui and Feng ^[34] argued that the mode and dynamics of economic growth have seen transformation, the promotion of rural revitalization combines cutting-edge digital technologies and rural digital economy to transform the growth dynamics and make up for the shortcomings of development in rural areas, and digital economy empowerment is required for the revitalization of ethnic areas. According to Sun ^[35], the economic development of ethnic minority regions can be promoted by building “digital platform” carriers to create a first-class science and innovation environment, developing ecological tourism to integrate special regional resources, and creating a special agricultural economy to meet market demands. Using 12 cases and the panel data of 30 provinces (autonomous regions and municipalities directly under the central government) from 2012 to 2019, Zhang *et al.* ^[36] found that digital economy, which includes digital infrastructure, agricultural digitization, and agricultural digital industrialization, and rural revitalization, which includes industrial prosperity, ecological livability, rural style, effective governance, and affluent living, are cross-coupled through key activities in both internal and external environments. In conclusion, although the degree of development of digital economy is generally weaker than that of rural revitalization, the former grows significantly faster than the latter, the gap between them is gradually narrowing, and a strong correlation exists between digital economy and rural revitalization.

Disclosure statement

The author declares no conflict of interest.

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