

Theoretical Research on Promoting the Integrated Development of Rural Industry Through the Digital Economy

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Abstract: With the rapid development of the Digital Economy (DE), its role in promoting the integration of rural industries has become increasingly significant. This paper focuses on theoretical research regarding the integration and development of rural industries in the context of the DE, aiming to explore how the DE facilitates the integration of rural industries and contributes to achieving the strategic goal of rural revitalization. The study employs the SWOT analysis method to systematically evaluate the strengths, weaknesses, opportunities, and threats associated with rural industrial integration (RII) in the digital economy era. The findings suggest that while China's rural areas are rich in industrial resources and strongly supported by government policies, factors such as short industrial chains, low levels of integration, and an underdeveloped capital and financial service system continue to restrict the development of RII. Although the digital economy era presents significant opportunities for the advancement of intelligent and information-driven digital technologies, it also faces external challenges, such as the digital divide and insufficient laws and regulations. Based on these findings, the paper proposes strategies to strengthen the construction of digital infrastructure (DI), improve rural digital literacy and skills, promote the integrated development of primary, secondary, and tertiary industries, and establish and enhance rural financial risk prevention and control mechanisms. These strategies aim to provide both theoretical support and practical guidance for the integration of rural industries and the promotion of sustainable rural economic development.

Keywords: Digital economy, Rural industrial integration, SWOT analysis, China, Digital divide

1. Introduction

The Digital Economy (DE) has emerged as a transformative economic paradigm in the 21st century, fundamentally reshaping traditional economic structures and operational models. At its core, DE leverages advanced information technologies - including Internet infrastructure, big data analytics, cloud computing platforms, and artificial intelligence systems - to optimize resource allocation efficiency and drive structural transformation across economic sectors. Concurrently, the integration and development of rural industries, as a critical component of China's rural revitalization strategy, represents a strategic response to traditional agricultural limitations. This initiative focuses on

transcending conventional single-industry boundaries through the promotion of agricultural producer services and the enhancement of agricultural socialization service systems. By incorporating modern industrial development concepts, it fosters the emergence of innovative agricultural practices and new industrial forms, thereby facilitating the transformation of agricultural development patterns. Ultimately, this integrated approach aims to achieve diversified and sustainable development of the rural economy, creating synergies between digital transformation and rural modernization.

The DE is key to realizing the integration of rural industries and rural revitalization. It provides unprecedented technical support and creates vast opportunities for the integrated development of rural industries. For example, the widespread application of digital technologies such as precision agriculture, smart logistics, and e-commerce platforms can effectively address issues like information asymmetry between agricultural product supply and demand and low circulation efficiency. This, in turn, helps optimize and upgrade the agricultural supply chain, expand the sales channels for agricultural products, and enhance the competitiveness of the agricultural industry. Furthermore, DE promotes the deep adjustment and upgrading of rural industrial structures by facilitating the integration of agriculture, tourism, culture, processing industries, and other diverse sectors. This leads to a new pattern of mutual promotion and integrated development, injecting new vitality and momentum into the rural economy.

China is a major agricultural country; however, the integration and development of its digital economy and rural industries face numerous challenges. First, some research proposals for the DE driving rural industrial integration (RII) lack feasibility due to an absence of clear transformation paths and excessive investment requirements that exceed the capacities of businesses. Second, the lack of timely rural data, as well as data gaps and fragmentation between business entities, hinder the efficient and secure integration of production factors, raising the costs and risks of digital transformation. Third, the insufficient capacity for talent support, inadequate rural infrastructure, and the lack of relevant laws, policies, and capital investment mechanisms present additional obstacles to development. Therefore, studying the impact of the digital economy on RII is of immense value and significance for achieving the strategic goal of rural revitalization, promoting urban-rural integration, improving farmers' living standards, and building China's modern agricultural industrial, production, and management systems.

This study focuses on the impact of the digital economy on the integrated development of rural industries. Using SWOT analysis, it systematically evaluates both internal factors (strengths and weaknesses) and external factors (opportunities and threats) that affect the integration of rural industries in the context of the DE, providing a basis for proposing targeted development strategies.

2. Literature Review

The literature most closely related to this study focuses on the impact of the digital economy on RII. Wang, H., and Qian, Q. [1] argue that the DE has characteristics of high diffusion, spillover effects, and universality, and that the integrated development of the three rural industries through the DE has become essential for building a modern rural industrial system and achieving high-quality rural development in China. Zu, R. [2] notes that the development of the digital economy plays a role in promoting the integration of rural industries, with a significant threshold effect linked to carbon emissions as the threshold variable. Qiu, S., and Teng, J. [3] state that the digital dividend resulting from the integrated development of the three rural industries is more pronounced in western China than in the eastern and central regions. Technological innovation and industrial structure upgrading are identified as key mechanisms by which the DE fosters the integrated development of rural industries. Meng, W. et al. [4] observe that the digital economy has a more significant role in promoting rural industrial integration in the eastern and southern regions, with areas of higher economic development and educational levels showing a greater impact. Shu, Y. [5] argues that the

DE supports rural industrial integration by providing technical, financial, and marketing support. Deng, Z., and Huang, Y. [6] highlight several issues, including the smooth integration process of the digital economy with rural industries, insufficient digital infrastructure (DI) in rural areas, a lack of digital talent, inadequate reform efforts, limited digital data collection, and poor management systems. Shao, X. [7] explores the challenges of integrating the three rural industries in Henan Province, suggesting future infrastructure development, bridging the digital divide, promoting technological empowerment, and enhancing digital skills among farmers.

Another body of literature is also relevant to this study, focusing on how the DE influences agricultural and rural development. Sun, Q., and Qiao, H. [8] indicate that the digital economy will contribute to the revitalization of rural industries by improving efficiency, optimizing structure, and upgrading industrial chains. Leng, X., and Tong, G. [9] suggest that the digital economy makes the greatest contribution to the agro-processing industry and has the highest degree of integration with agricultural product transportation and sales industries. Liu, X. et al. [10] find that compared to the real economy, the DE's agglomeration effect is more pronounced, with a significant economic gradient. Yan, M., and Cao, X. [11] observe that the digital economy initially promoted rural industry integration but later restrained it. Zhang, Z. et al. [12] assert that technological innovation and rural human capital are crucial mediating factors in the promotion of rural industry integration by the digital economy.

Based on the existing research, this paper makes the following four contributions: First, in terms of topic selection, although research on the integration of the DE and rural industries is gradually increasing, few systematic theoretical studies specifically address how the digital economy can promote the integrated development of rural industries. This paper fills this gap by focusing on this area and using SWOT analysis to explore the integrated development of rural industries in the context of the DE. It provides a new theoretical framework and research approach to understanding the complex relationship between the digital economy and rural industries. Second, in terms of research methods, this paper uses SWOT analysis to systematically evaluate the advantages, disadvantages, opportunities, and threats related to rural industrial integration under the DE. Third, in terms of research samples, this paper draws on the latest data from authoritative sources, such as the National Bureau of Statistics of China. These data are comprehensive, current, and highly authoritative, which enhances the accuracy, objectivity, and timeliness of the research conclusions. This provides valuable economic insights for relevant policy formulation and practical applications. Fourth, based on the results of the SWOT analysis, this paper offers targeted and personalized recommendations for the development of rural industrial integration in the context of the DE.

3. SWOT Analysis

SWOT analysis is a strategic framework developed by management professor Verrick at the University of San Francisco in the early 1980s, represents a comprehensive approach to strategic planning. The acronym SWOT encompasses four critical dimensions: Strengths, Weaknesses, Opportunities, and Threats. This analytical tool facilitates robust enterprise decision-making and strategic planning through a systematic evaluation of both internal factors (Strengths and Weaknesses) and external environmental factors (Opportunities and Threats) that an organization or individual encounters. By providing a structured assessment of these elements, SWOT analysis enables decision-makers to align organizational resources with external conditions, thereby enhancing strategic effectiveness and competitive positioning.

4. Strengths

Industrial resources with agriculture as the main sector: Agriculture has become the smallest sector in developed regions. In countries such as the United Kingdom and the United States, agriculture accounts for less than 5% of their industries. For instance, in the first half of 2024, the GDP of agriculture (including agriculture, forestry, animal husbandry, and fisheries) in the United States was approximately \$175.8 billion, representing only 0.83% of the total GDP. In contrast, in China's rural areas, agriculture remains the primary industry. As shown in Figure 1, the proportion of agricultural employment in China has been declining since 2004, but it still remained relatively high in 2023, reaching 22.8%. This indicates that agriculture remains an important source of employment in China. The share of agricultural added value has also decreased but at a slower pace, from 12.9% in 2004 to 7.1% in 2023, which shows that agriculture is still a significant part of the national economy. Agriculture is often characterized by short industrial chains and relatively low added value. Industrial integration can enable the efficient application of modern science and technology, cultural creativity, and ecological concepts to agriculture, promoting the development of new business models such as leisure agriculture, ecological agriculture, and creative agriculture. Thus, China's agriculture-dominated industrial resources serve as a crucial advantage in the development of RII.

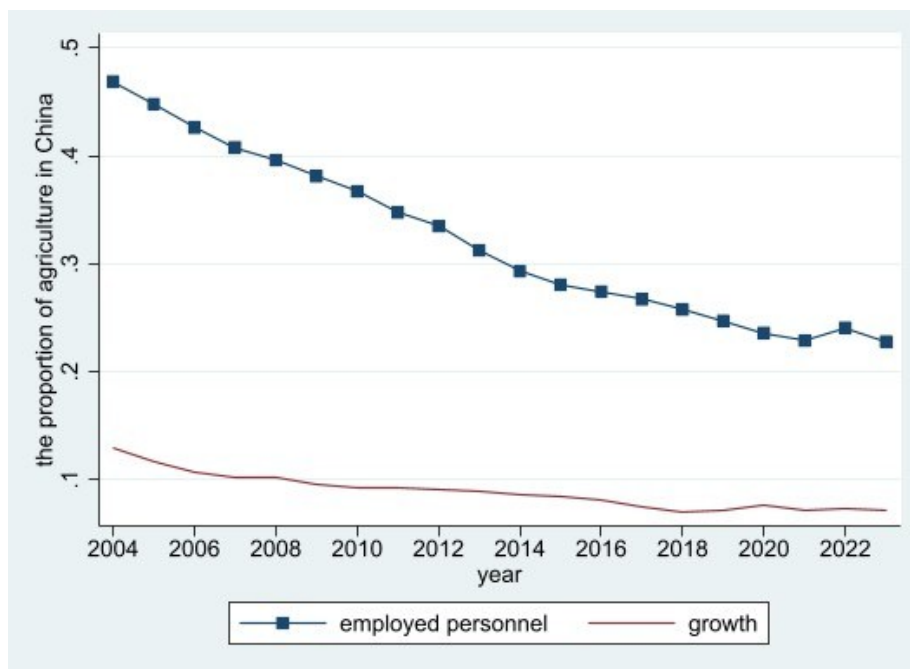


Figure 1: Trends in China's agricultural development.
Source: The National Bureau of Statistics of China

Strong support from national policy: Over the years, China's central government has repeatedly emphasized the importance of RII, introducing a series of policies and measures to promote its development. For example, the No. 1 Central Government Document in 2024 clearly states the need to improve rural industrial development and promote the integrated development of rural primary, secondary, and tertiary industries. The document outlines several measures, including strengthening agricultural infrastructure, integrating modern agricultural technologies with traditional farming, and promoting the integration of agricultural production with rural industries such as energy, logistics, and tourism. Other policy documents, such as those addressing the acceleration of rural industrial integration and the experiences from the "Thousand Village Demonstration" and "Ten Thousand Village Renovation" projects, also provide policy support and guidance from multiple perspectives.

It can be concluded that the central government's attention and support constitute a significant policy advantage in the development of RII.

4.1. Weaknesses

Short industrial chain and low level of industrial integration: At present, there are several issues in China's rural industrial sector, such as the insufficient extension of agriculture to the backend, limited expansion of industry at both ends, slow development of the service industry, and an imperfect interest connection mechanism. According to the report by the State Council on rural industry development, the ratio of the agricultural products processing industry to total agricultural output value in China is 2.3:1, far lower than the 3.5:1 ratio in developed countries. Additionally, the conversion rate of agricultural product processing is 67.5%, nearly 18 percentage points lower than that of developed countries. In many regions of China, agricultural products are primarily supplied as raw materials, and the supply chain from farm to table is not well-established. The number of deep-processing agricultural enterprises is limited, with particularly slow development in animal husbandry deep processing. Moreover, rural production and living service capacities are not strong, with some areas still lacking rural infrastructure and production and service facilities. Therefore, the integration of rural industries faces basic disadvantages, including a short industrial chain and a low level of integration.

Lack of a stable capital investment and financial service mechanism: According to statistics from the People's Bank of China, by the end of 2023, the balance of RMB loans from financial institutions amounted to 237.59 trillion yuan, with agricultural loans accounting for 56.6 trillion yuan, or about 23.82%. However, compared to the significant demand for rural financial markets, the scale and growth rate of agriculture-related loans still need improvement. In addition, the total assets of rural financial institutions, relative to the total assets of all banking institutions, remain low. At the end of the fourth quarter of 2023, the total assets of China's banking financial institutions amounted to 417.3 trillion yuan, while the total assets of rural financial institutions were 54.6 trillion yuan, making up only 13.1%. Without a comprehensive financial service mechanism, it is impossible to offer a wide range of financial products, which presents a financial disadvantage that must be addressed for the successful integration of rural industries.

4.2. Opportunities

The creation of various intelligent and informational digital technologies: Since the 21st century, economies worldwide have entered the digital economy era, driven by new generations of information technologies, producing important innovations such as artificial intelligence, cloud computing, big data, blockchain, and e-commerce. The application of these digital technologies can improve agricultural production models by shifting from traditional, experience-dependent methods to data-driven approaches, thereby increasing the degree of integration within the agricultural industry. For instance, digital technologies such as e-commerce platforms can directly reduce the intermediate steps in agricultural product sales, broaden sales channels, and promote the emergence of new forms of rural industry integration. The application of big data and Internet of Things (IoT) technologies enables precision agriculture, enhancing agricultural production efficiency and resource utilization. The integration of the digital creative industry with agriculture, such as agricultural tourism apps and live-streamed agricultural product sales, has introduced new growth opportunities for rural industries. In summary, the emergence of various intelligent and informational digital technologies in the digital economy era creates a technology-driven environment conducive to the integrated development of rural industries, offering significant opportunities for RII.

4.3. Threats

The digital divide: The digital divide in China's rural areas is a major issue, particularly due to the lack of necessary network infrastructure and digital skills in some remote areas, which makes it difficult for them to benefit from the digital dividend. According to the "Key Points of Digital Rural Development in 2024," by the end of 2024, the number of broadband access users in rural areas will still be low. By mid-2023, about 60% of rural residents had internet access, with the rural internet penetration rate still lagging behind that of urban residents. Regarding digital skills, the "Survey Report on National Digital Literacy and Skills Development Level (2024)" highlights significant differences in digital literacy levels between urban and rural populations. In urban areas, 65.92% of adults and 70.94% of minors have digital literacy at or above the primary level, whereas only 50.57% of rural adults and 53.11% of rural minors have reached that standard. The digital divide greatly affects the diffusion and application of digital technology and hinders the sustainable development of the DE, posing a technical challenge to the integrated development of rural industries.

Lack of updated legal regulations: The absence of updated legal regulations makes it difficult to adapt to the needs of new business models in the DE. Currently, there are no clear norms regarding the legal supervision of e-commerce platforms, data ownership, and other issues. For instance, in the live-streaming sector, there are problems such as uneven product quality and misleading marketing; in community group buying, there is price dumping and disordered competition. There is an urgent need for regulations to address these challenges. In the digital economy era, data has become a key factor of production. However, China's laws on data ownership remain underdeveloped. While the Civil Code, Personal Information Protection Law, and Data Security Law define data to some extent, the ownership of data remains unclear and difficult to define in practice. The lack of a clear legal framework for data ownership leads to ambiguity in data transactions and usage, which can result in disputes. If these legal issues are not effectively addressed, they will hinder the positive role of the DE in promoting the integrated development of rural industries.

5. Conclusion

This paper examines and analyzes the advantages of agriculture-rich industrial resources and the disadvantages of a short industrial chain, as well as the lack of a stable capital investment mechanism and a comprehensive financial service system. In the era of the digital economy, various intelligent and informational digital technologies provide significant opportunities for the integrated development of rural industries. However, the integration of rural industries faces challenges, as existing laws and regulations struggle to adapt to the external environmental threats posed by the development of new business models in the DE.

The implications of this conclusion are fourfold: First, there is a need to strengthen the construction of the DI, including increasing investment in network communication infrastructure in rural areas, planning and constructing rural big data centers, narrowing the digital divide between urban and rural areas, and breaking down data silos. Second, it is essential to improve digital literacy and skills in rural areas. This can be achieved by offering multi-level and diverse digital skills training programs for rural residents, particularly farmers, rural entrepreneurs, and grassroots leaders, while implementing preferential policies to attract digital technology talent to start businesses or seek employment in rural areas. Third, the integrated development of primary, secondary, and tertiary industries in rural areas should be promoted. Rural enterprises should be encouraged to use digital technology for cross-industry operations and to develop new business models such as rural e-commerce, rural tourism, and rural cultural creativity. Establishing demonstration parks for rural industry integration and showcasing the application of digital technologies in rural industrial development would also be beneficial. Fourth, it is crucial to establish and improve the rural financial

risk prevention and control mechanism, as well as a monitoring and early warning system, to detect and address financial risks and hidden dangers in a timely manner. Financial institutions should be guided to strengthen internal controls and risk management, establish risk reserve systems, and improve their ability to withstand financial risks. Additionally, financial institutions should be encouraged to collaborate with insurance companies to offer rural financial products, such as loan guarantee insurance and agricultural insurance, to help mitigate financial risks for rural enterprises and farmers.

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