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Research on the Impact of Digital Economy Enabling Green Development Efficiency Under the Background of "Dual Carbon"

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Abstract

Under the background of "double carbon", achieving carbon peak and carbon neutrality is the only way and inevitable choice for China's economic development. Digital economy can enable green development efficiency by improving the efficiency of resource factor allocation, helping green and low carbon life transformation, deepening green scientific and technological revolution, and promoting green and inclusive financial development. By collating relevant literature and based on policy background, digital economy and green transition theory, this paper in-depth discusses the current system of China's digital economy and green development, analyzes the influence mechanism and internal path of enabling green development efficiency improvement of the digital economy, provides theoretical knowledge and puts forward policy suggestions based on research conclusions for the integration of digital technology and green economy transition and development path.

Keywords

Double carbon; Digital economy; Green development; Green development efficiency.

1. Introduction

As the ecological environment in economic development has become the focus of the whole society, the establishment of green low-carbon circular economic development system has become the key link in China's economic construction. The report of the Party's 20th National Congress also determined the overall tone of promoting carbon peak neutrality. Green development can not only promote the green upgrading of social production and operation methods, but also reduce the increase in energy demand required for economic growth. In the process of green development, improving efficiency is the top priority.

After the advent of the digital economy era, the integration of digital technology development and innovation into production and life has become a general trend, and the development of digital economy is an important support for the development of China's urban economy. The penetration of the booming digital economy technology into production and life provides a new way to improve the efficiency of green development. The use of a new generation of digital technology to promote the development of green economy and the deep integration of green and low-carbon industries into digital technology is an important path to improve the efficiency of green development.

Therefore, in the context of the "double carbon" goal, the organic combination of digital economy and the improvement of green development efficiency, and the study of the current situation, influence mode and internal mechanism of digital economy enabling green development efficiency have important guiding significance for promoting green development and green transformation and upgrading of economic production, and provide theoretical basis for the formulation of relevant policies and regional green economy development.

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2. Literature review

With the global popularity of the concept of green sustainable development, the study of green development efficiency has become a hot topic in the academic circles at home and abroad, and many experts and scholars have studied green development efficiency from various angles. The research on the efficiency of green development mainly focuses on two parts. One is the theoretical research on the concept, system and mode of green development. The second is to study the index system and model construction of measuring green development efficiency.

In terms of theoretical research on the concept, system and model of green development, Sun Lin and Ge Yanyan (2023), by focusing on the dialectical structure of China's modernization and Marxist materialist dialectic thinking, connect the concept of green development with agricultural modernization, and based on rural green development, discuss the theoretical mechanism of the green development concept driving the modernization of the Chinese model [1]. Xia Yingzhe (2022) studied the important role of PPP model of government and capital cooperation in promoting green development and ecological civilization construction [2]. Li Wenwen and Liu Yuxin (2022) et al. studied China's green development model from the perspective of agriculture and business [3]. He Na (2022) made a comparative analysis of traditional individual farmers and new agricultural management themes, summed up the green development mode of new agricultural management organizations, and proposed targeted solutions to provide an optimization path for the green and sustainable development of new agricultural management [4]. Wang Luna, Guan LAN (2019) et al., starting from the typical characteristics of green development of enterprises, explored the micro-mode of green development in order to maximize efficiency.

In the research field of measuring the index system of green development efficiency, Li Shuang et al. (2019) empirically analyzed and studied the influencing factors of green efficiency through the panel Tobit model, and believed that there was an inverse U relationship between the level of economic development and green development efficiency [5]. Wang Yu et al. (2023) calculated the provincial green development efficiency by adopting the super-efficiency SBM-Malmquist model based on the provincial panel data of China, and believed that the overall green development efficiency of China was rising steadily, but the growth rate was small and the efficiency was low, and the efficiency showed a gradual decline from the east to the west [6]. Meng Wangsheng et al. (2022) used the panel data of prefecture level cities in the Yellow River Basin during the decade from 2007 to 2017 to construct an indicator of green development efficiency using the Malmquist-Luenberger index, and the empirical results showed that natural resource endowment inhibited the green development in the Yellow River Basin. Moreover, the inhibition effect in the middle and upper reaches is more obvious than that in the upper reaches [7]. Zhao Linfrederic (2023) used qualitative comparative analysis to investigate the joint response of various impression factors to the efficiency of China's green development and put forward relevant policy recommendations [8].

3. The present situation of the digital economy to promote sustainable development of the green

3.1. Digital economy development status

Digital economy is a new economy based on intelligent network represented by the development and popularization of the Internet, which has the characteristics of high data and is a new driving force for future development. With the integration of 5G, artificial intelligence, cloud computing and other new generation digital technologies and life, digital economy has become a new trend of global economic development, digital economy has become an important part of the national economy, digital industry digitalization as its leading industry, is

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the main engine of the development of digital economy. All national economies have realized the importance of the development of the digital economy and made relevant policies to support technological innovation.

The United States mainly focuses on the research and development of cutting-edge technologies in the digital economy, and promotes the practical application of advanced technologies in economic development and economic industry through technological innovation and technological breakthroughs. The release of Germany's "Digital Strategy 2025" emphasizes the focus on the digital transformation of traditional industries, increases the development speed of the digital economy, and promotes the digital transformation of enterprises; Japan mainly focuses on scientific and technological innovation, and accelerates the digital transformation and upgrading of the real economy through personnel training and technological innovation. As the world's second largest digital economy, the digital economy has become the backbone of national economic growth. According to the White paper on the development of China's digital economy in 2022, the scale of China's digital economy in 2021 has reached nearly 50 trillion yuan, established the world's largest 5G network, and is the global leader in 5G standard technology.

3.2. Current situation of green development in China

Since the 18th CPC National Congress, China has steadfastly taken the road of green and sustainable development, promoted the comprehensive transformation of the economy and society to the direction of green development, and actively participated in global environmental and climate governance in order to achieve the process of carbon peak by 2030. In recent years, China's agricultural green production scale has been expanding continuously, it is obvious that the national policy has given a lot of programs and policy support on the road of green agricultural development. The variety of green agricultural products has increased greatly, the cultivated land for agricultural products in the country has continued to expand, the optimization and upgrading of the agricultural industry has accelerated, and the living standards of rural residents have also been greatly improved. At the same time, the manufacturing industry represented by high energy consumption and high emissions has become an important industry for energy conservation and emission reduction. By promoting the green transformation and upgrading of the manufacturing industry, the government continues to plan the specific implementation plan of the dual-carbon goal, and takes the road of green development of the industrial manufacturing industry through industrial policy support and green talent attraction. In July 2021, the carbon emission trading market was officially launched in China, marking a new stage of carbon emission trading.

4. The internal mechanism of digital economy enabling green development

4.1. Digital economy to improve the efficiency of resource factor allocation to promote low-carbon transformation

As an important factor of production, data is an essential key node in the process of green transformation and upgrading and green sustainable development. In the era of digital economy, the importance of data has been greatly increased, and data has the characteristics of zero pollution and zero emission, which is a very green production factor. The increasing importance of data means that the industrial structure is being transformed and upgraded in a green and sustainable direction, which has greatly enabled green development. The development of the digital economy has accelerated the development of information technologies such as blockchain, big data, 5G, artificial intelligence, and cloud storage, greatly improving the convenience of data information transmission, and can promote people to enter

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a low-carbon life, reduce carbon emissions, and enable low-carbon green transformation by improving energy efficiency and optimizing energy consumption structure.

4.2. Digital economy promotes green development with intelligent and efficient detection of ecological environment

The development of the digital economy has improved the level of digital governance, and an important feature of digital governance is intelligence. The vigorous development of the digital economy has brought about the improvement of computing power, which can more accurately calculate the green low-carbon, energy saving and emission reduction information of various units of the society than ever before, and realize the high-efficiency and intelligent detection of the ecological environment through intelligent global detection. On this basis, environmental information can be arranged effectively and environmental mechanisms can be carried out more efficiently, thus improving the efficiency and level of green development.

4.3. Digital economy to deepen digital technological innovation to promote social digital transformation

Innovation is the driving force of enterprise development. In 2025, China's digital economy will enter a stage of comprehensive expansion, and the value added of the core industry of digital economy will occupy 1/10 of the total GDP. Digital economy is a new digital revolution, the key element of "data resources" will be integrated with information technology, and develop into an efficient and accurate economic form. The development of the digital economy promotes scientific and technological innovation at the social level, and the improvement of the innovation level also accelerates the accumulation of talents, the efficiency of social digital transformation is improved, the problem of information asymmetry is greatly reduced, and the efficiency of resource utilization is continuously increased. The digital economy provides a shortcut for the green development of society by promoting scientific and technological innovation.

4.4. The digital economy is promoted in a way that promotes the development of green and inclusive finance

The development of the digital economy has significantly improved the popularity, depth and coverage of digital society, and has obviously promoted the development of digital inclusive finance. Digital inclusive finance can improve the overall operational efficiency of the economic system by optimizing the information transmission path, reduce the operating cost of the economic system, and greatly improve the operational efficiency and accuracy of the operation, which can greatly promote the process of economic development and bring about the improvement of regional green development efficiency.

At the same time, the digital economy promotes the development of digital inclusive finance, and also indirectly promotes regional technological innovation. Inclusive finance has the characteristics of extensive and universal, and the vigorous development of digital inclusive finance can greatly weaken the information asymmetry, but also reduce the financing threshold of financial institutions, so that research and development investment can be increased, investors will increase investment in green industries, and the overall green development level and green development efficiency will be improved.

5. Summary and outlook

With the development of The Times, green and low-carbon life has become the consensus of more and more people, through the practice of low energy consumption, low pollution, low emissions of life mode, is an important way for human sustainable development and economic green transformation and upgrading. Facing the key goal of carbon neutrality and carbon peak,

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it is the only way to improve the efficiency of green development through the key grasp of digital economy. In order to better enhance the driving force of the digital economy for green development, investment in the digital economy should be increased in order to stimulate the development vitality of the digital economy. Through the combination of theoretical and empirical research, increase the ability of independent innovation, weaken the regional "digital divide", improve the talent training mechanism, and support the digital economy to improve the efficiency of green and sustainable economic development by gathering digital high-end composite talents.

At the same time, the government should strengthen the capacity of digital governance and play the role of driving and guaranteeing the digital economy. The era of digital economy has come. Only by seizing the opportunities of The Times and making positive changes can we achieve green, sustainable and high-quality economic development. To explore the internal mechanism between digital economy and green development efficiency is of great significance to the integration of China's economic digitization and green transformation development. The development of digital economy and economic green development is an important part of China's high-quality economic development.

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Reference

[1] Sun Lin, GE Yanyan, Jiang Shu. Study on Dialectics of Chinese modernization driven by green development Concept [J]. Journal of Nanjing Agricultural University (Social Sciences Edition),2023,23(03):11-20.

[2] Wang Yu, Feng Jianghua. Measurement and analysis of provincial green development efficiency in China: Based on super-efficiency SBM-Malmquist model [J]. Journal of Heilongjiang Ecological Engineering Vocational College,2023,36(03):7-12.

[3] Hu Jie, Yu Xianrong, Han Yiming. Can ESG ratings promote green transformation? -- Verification based on multi-time point differential method [J/OL]. Research of Quantitative and Technical Economics :1-22[2023-06-07].

[4] Zhang Zhehua, Zhong Ruoyu. Digital economy, green technology innovation and urban low-carbon transformation [J]. China Circulation Economy,2023,37(05):60-70.

[5] Zheng Hui, Zhang Xiao. Whether Fintech strengthens the influence of green credit policy on technological innovation of heavy polluting enterprises [J/OL]. Journal of Ocean University of China (Social Sciences):1-8[2023-06-07].

[6] Guo Hong, Yin Jing. Study on the Impact of green Credit Policy Implementation on Investment Efficiency of Heavily Polluting Enterprises: Promote or Inhibit? [J]. Modern Finance and Economics (Journal of Tianjin University of Finance and Economics),2023,43(05):85-99.

[7] Liu Juan, Liu Mengjie. Does low-carbon transition affect enterprises' outward direct investment? Empirical evidence from low-carbon pilot cities in China [J]. International Trade Issues,2023(03):53-70.

[8] Wang Pengfei. ESG rating of heavy polluting enterprises and enterprise green innovation [J]. Business Observation,2023,9(05):98-101.

[9] Meng Wangsheng, Liu Huazhen, Zhang Yang. Natural resource endowment, environmental regulation and green development in Yellow River Basin [J]. Review of Industry Organization,202,16(03):96-122. (in Chinese)

ISSN: 2688-8653

[10] Huang Xiaohui, Nie Fengying. Research on the mechanism of digitalization driving farmers' green and low-carbon agricultural transformation [J]. Journal of Northwest A&F University (Social Science Edition),2023,23(01):30-37.

[11] Central Committee of Zhigong Party of China. Promote the sustainable and healthy development of digital economy [J]. China Development,2022,22(05):85-89.

[12] Xia Yingzhe. Standardize and develop the public-Private Partnership (PPP) model to add impetus and vitality to green development [J]. Environmental Protection, 2002,50(16):45-47.

[13] Wu Qun,Liu Xinwang,Qin Jindong,Zhou Ligang,Mardani Abbas,Deveci Muhammet. An integrated generalized TODIM model for portfolio selection based on financial performance of firms[J]. Knowledge-Based Systems,2022,249.

[14] Liu Hanqi. Research on the influence of Science and technology finance Policy on the financing of small and medium-sized science and technology enterprises [D]. Sichuan University,2022.

[15] Horna. A new mode of agricultural operation organizations green development, problems and countermeasures research [J]. Journal of shanxi agricultural economy, 2022 (8) : 55 to 57. DOI: 10.16675 / j.carol carroll nki cn14-1065 / f 2022.08.018.

[16] Research on China's industrial green development model [J]. Economic Outlook around Bohai Sea,2022(04):10-12.

[17] Li Keyu. Wang Wen, Executive Dean of Chongyang Institute for Financial Studies, Renmin University of China: The vigorous innovation of digital economy empowers green development [N]. National Business Daily,2021-09-07(005).

[18] Liu Yunqin. A study on the influence of pilot policies combining science and technology and Finance on urban innovation level [D]. Shanghai Normal University,2021.

[19] Feng Yongqi, Qiu Jingjing. Analysis on the effect and heterogeneity of industrial structure upgrading of science and technology finance policies: a quasi-natural experiment based on the "pilot combination of science and technology and finance" [J]. Industrial Economics Research,2021(02):128-142.

[20] Xu Yuexian, Li Tuo, Lu Lili. A study on the impact of pilot policies combining science and technology and Finance on regional economic growth: from the perspective of science and technology innovation and industrial structure rationalization [J]. Journal of Chongqing University (Social Science Edition), 2019,27(06):1-15.

[21] Zhao Meihua, Ge Yang, Sheng Jianzhong. Application and prospect of Fintech in ESG investment [J]. Fintech Era,2020(11):44-45+49.

[22] Yu Hongwei, Wang Junsu, Zhang Xu, Huang Yuanyuan, Shi Daqian. Does the combination of technology and finance promote the high-quality development of technology-based smes? [J]. Journal of Investment Research, 2019,39(10):128-151.

[23] Lu Kuan. The impact of Sci-tech Finance on Investment Efficiency of Private Enterprises [D]. Inner Mongolia University,2020.

[24] Zheng Shiming, Wu Yijia, Zouke. Will pilot policies combining technology and finance work? Research based on difference-based method [J]. China Soft Science,2020(01):49-58.

[25] Ma Lingyuan, Li Xiaomin. Do tech finance policies promote regional innovation? -- A quasi-natural experiment based on "Promoting the pilot of combining Science and technology with Finance" [J]. China Soft Science,2019(12):30-42.

[26] Yi Xiaojin. Empirical Research on Factors affecting the quality of environmental Accounting information Disclosure of Listed companies [D]. Fudan University,2012.