Research on Ecological Transformation of Industrial Structure Empowered by Digital Economy

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Abstract: With the transformation of the main contradictions in Chinese society, the goal of social and economic development has shifted from rapid economic development to high-quality economic development. In the new era, China's economic development is facing new problems such as quality improvement and deceleration, structural transformation and dynamic change. Realizing economic structural transformation, kinetic energy conversion and balanced development has become the primary goal of economic development. By reviewing the status quo of the integration and development of the digital economy and traditional industries and sorting out the theoretical logic of the digital economy promoting the transformation and upgrading of the industrial structure, this paper puts forward some effective paths for the digital economy to empower the ecological transformation of the industrial structure, in order to provide some suggestions for seizing the dividends of the digital economy and promoting the ecological transformation of the industrial structure.

Keywords: Digital Economy; Industrial Transformation; Ecologicalization; High-Quality Development

Introduction

At present, the change of China's industrial structure is rapidly evolving towards green and ecological direction. On the whole, the ecologicalization of industrial structure is a process of dynamic evolution of industrial structure. It is a process of transforming from a high-energy-consumption and high-pollution industrial structure to a green, low-carbon, and environmentally friendly ecological industrial structure. In addition, as an emerging economic form, the digital economy has a transformative impact on the high-quality development of China's economy, and has a significant superimposed and multiplied effect on the ecological transformation of the industrial structure [1]. The central government attaches great importance to the development of the digital economy, and continues to increase its efforts to promote the digital economy to empower the real economy.

1. The Integration Development of Digital Economy and Traditional Industries

The high penetration and strong diffusion characteristics of the digital economy and the development bottleneck of traditional industries make the development of industrial integration an inevitable trend. The integration and development of digital economy and traditional crossover is a practical process of finding production relations that adapt to the development of new productive forces. Figure 1 reports the development scale of China's digital industrialization and industrial digitalization and their proportions in the total digital economy from 2014 to 2020. Both digital industrialization and the total scale of industrial digitalization are showing an upward trend, in which the growth rate of industrial digitalization scale is significantly higher than that of digital industrialization; the proportion of industrial digitalization has gradually increased, from 73.95% in 2014 to 80.90% in 2020. Compared with the proportion of digital industrialization, the scale of industrial digital transformation and development is about three to four times the scale of the digital economy industry. The scale of digital industrialization continues to grow, but its proportion in the digital economy has declined slightly. The total amount and proportion of industrial digital development have continued to grow, which has become an inevitable trend in the development of the digital economy. From the perspective of the integration and development of the digital economy and

the three industries, the integration levels of the digital economy and the three industries were 6.2%, 16.8%, and 29.6% in 2014, respectively, and increased to 8.9%, 21%, and 40.7% in 2020. It can be seen that the level of integration between the digital economy and the three industries has improved, and the level of integration with the tertiary industry is the highest, followed by the secondary industry, and finally the primary industry. Digital technology was first applied to industries such as tourism, education, finance, catering, and retail, and derived new business forms such as e-commerce, online education, digital finance, and online catering, and promoted the digital transformation and development of the tertiary industry [2].

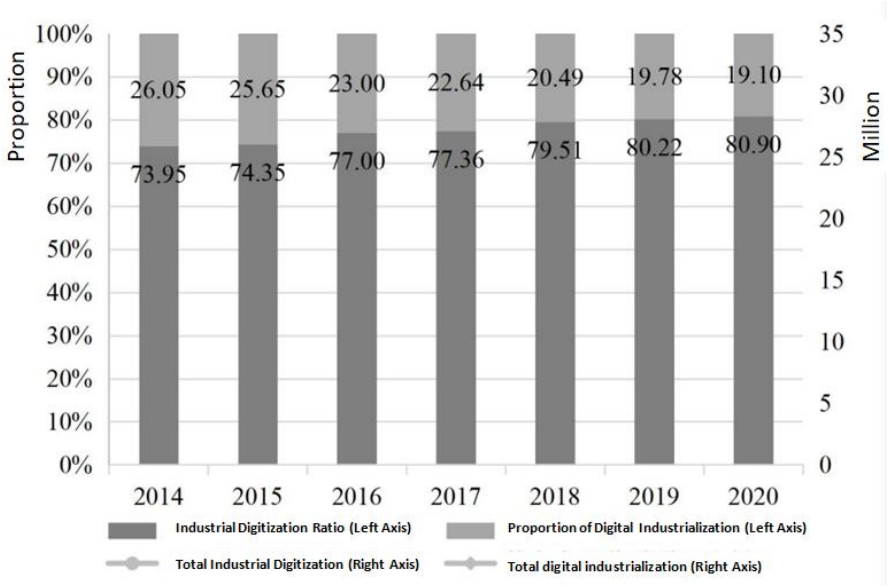

Fig 1: The scale and proportion of China's industrial digitalization and digital industrialization

2. Theoretical Logic of Digital Economy Promoting Transformation and Upgrading of Industrial Structure

2.1 The digital economy empowers the ecologicalization of the industrial structure

The impact of the digital economy on the ecologicalization of the industrial structure is mainly reflected in the digital economy's ability to change the traditional extensive economic development mode and spread the positive concept of green life. From the perspective of factor input, data, as the core factor of production, participates in the production process, replaces and squeezes out the input of traditional production factors such as land, labor, and capital, and has the inherent advantages of overcoming the constraints of resource quantities and the emerging dividend of increasing marginal effects [3]. The digital economy industry is a typical knowledge- and technology-intensive industry, which is an environment-friendly industry. Its development has little impact on the ecological environment, and the digital economy has a significant scale economy effect. With the increasing maturity of the digital technology system and the improvement of the digital economy ecosystem, the scale economy effect of the digital economy will lead to zero marginal costs, alleviate the destruction of ecological resources and pollution of the ecological environment by the traditional extensive development model, and improve ecological efficiency to promote green development. In addition, the digital platform helps to establish a bridge of benign interaction between citizens, enterprises and the government, starting from civic awareness, enterprise production, government supervision and other aspects, to ensure the quality of the ecological environment, and through the collection and analysis of data related to energy conservation and emission reduction, to achieve precise supervision and improve the efficiency of environmental supervision.

2.2 Digital economy facilitates innovation and transformation of industrial structure

The strong permeability of the digital economy enables new technologies and methods to be quickly applied to all stages of

pre-production, production process, and industrial management, accelerating the application and transformation of innovative achievements, and realizing industrial innovation, transformation and development [4]. Improve the concentration level of digital technology in traditional industries, traditional industries continue to introduce and absorb digital technology and digital management models, improve the internal organizational structure of the industry, innovate the industrial system, promote the transformation of industrial production methods and organizational structures to modernization, digitalization, and service-oriented transformation, and transform the internal management model of enterprises to an open, flat, and decentralized structural model. In the era of rapid development of the digital economy, market information asymmetry has eased, making changes in market supply and demand more transparent, intensifying market competition, forcing market players to innovate business models, improving technological innovation efficiency and speeding up the transformation of innovative technologies, and promoting the diversification of innovation players and innovation efficiency. At the same time, the transparency of market supply and demand will help improve the matching between the direction of enterprise innovation and research and development and actual demand, reduce innovation risks, and improve innovation efficiency.

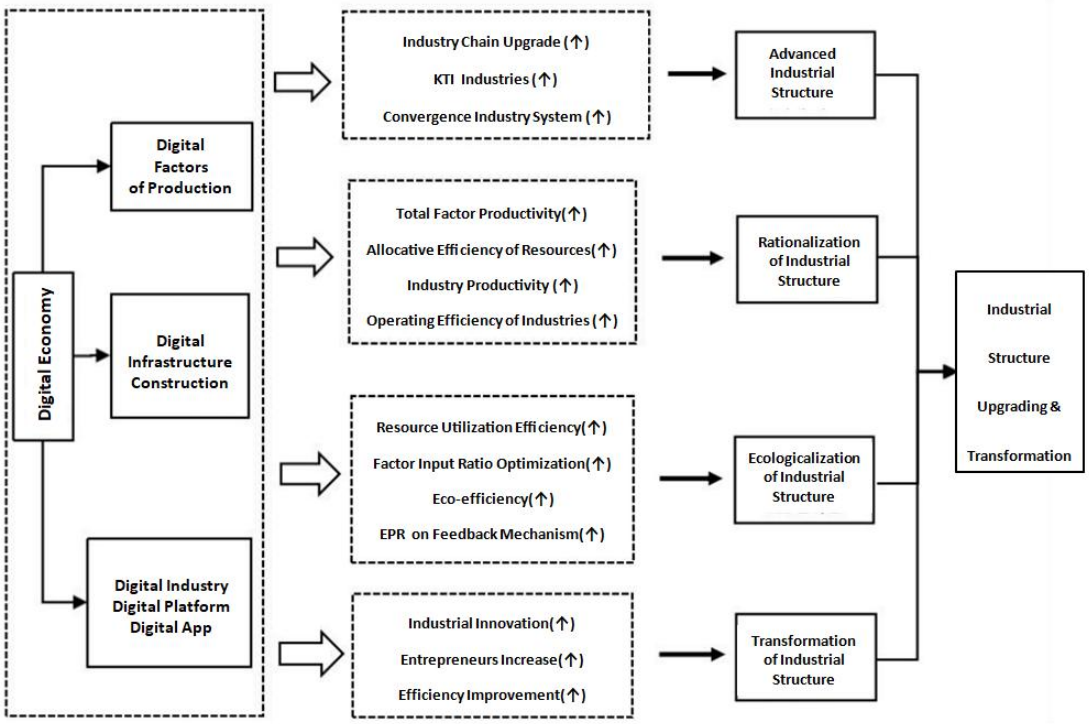

Fig 2：Theoretical Mechanism and Influence Path

3. Ecological Transformation of Industrial Structure Empowered by Digital Economy

3.1 Strengthen the construction of digital infrastructure and lay a solid foundation for integrated development

To promote the construction of the basic network system for the development of the digital economy, we should first vigorously promote the construction of data centers and Internet infrastructure to provide support for digital technology application scenarios. Promote the large-scale and green development of data centers, guarantee basic service functions such as data storage, processing, and applications, and guide the healthy and sustainable development of data centers. At the same time, accelerate the construction of data sharing platforms, promote the free circulation of data elements between industries, regions, and enterprises, promote the interconnection of data centers and the marketization of data elements, and provide data support for the digital transformation of the real economy.Secondly, strengthen the investment and construction of Internet infrastructure, promote the extensive coverage and application of the new generation of communication technology, and build a highly covered, interconnected, fast, efficient, safe and

reliable modern integrated network facility system through the deep connection of information network, Internet of Things and Internet, and provide a digital transformation foundation for industrial transformation, social operation, and people's livelihood security.

3.2 Promote the deep integration of the digital economy and the three industries, and fully release the benefits of the digital economy

The digital transformation of the service industry is in full swing. The new formats represented by digital services and digital operations promote the all-round, multi-angle and full-chain digital transformation of the service industry, and accelerate the digital, networked, and intelligent development of the traditional service industry. Education, medical care, catering, tourism and retail industries are the core areas of digital transformation of the service industry, promoting the rapid development of new digital economy formats represented by online education, online office, online medical care and e-commerce; digital management promotes consumption diversification and personalization, and realizes consumption structure transformation. The digital transformation of the manufacturing industry should be based on the economic foundation, development stage and industrial foundation of each region, select nodes with great development potential in the industrial chain according to local conditions, emphasize precise integration strategies, improve integration efficiency, reduce integration costs, and explore unique industrial integration models and paths suitable for the eastern, central, western, and northeastern regions. The industrial management system will comprehensively improve the scale and efficiency of the manufacturing industry, and accelerate the extension of the industrial chain and the upgrading of the value chain.

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