

Research on the coordinated development and optimization path of digital economy and green and low-carbon consumption under the double-carbon target —— Take Anhui Province as an example

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Abstract

With the rapid development of social economy, promoting the green and low-carbon consumption of residents has become a key path to deal with the increase of carbon emissions, which can effectively meet the growing consumption demand of residents. Under the framework of the strategy of "expanding domestic demand", the new development pattern pays great attention to the role of consumption in the economy, focusing not only on the growth of "quantity" of consumption, but also committed to the improvement of "quality" of consumption. At the same time, combined with the grey correlation method, explore other possible factors, to analyze the coupling mechanism between the two, and put forward the corresponding countermeasures, aims to promote the coordinated development of digital economy and green consumption, form a virtuous cycle, in order to realize the high quality of urban economic development and the sustainable development of the environment to provide new ideas and methods.

Keywords

Green and low-carbon consumption, double-carbon target, digital economy, and optimized path

1. Research background

Climate change has become one of the most severe environmental challenges in China and even in the world, and carbon dioxide emissions are widely considered to be one of the main drivers of climate change. As early as 1992, the United Nations Conference on Environment and Development adopted Agenda 21, which pointed out that the unreasonable production and consumption patterns of the causes of the deterioration of the ecological environment. China's annual emissions of carbon dioxide have more than 6 billion tons, ranking first in the world, so it is under great

international pressure in greenhouse gas emission reduction. In order to effectively reduce carbon emissions and actively respond to climate change, the Chinese government formally put forward the goal of "carbon peak and carbon neutrality" in 2020, planning to peak carbon emissions by 2030, and strive to achieve the goal of carbon neutrality by 2060. This strategy is not only an important measure for China to cope with global climate change, but also a core path to optimize the domestic economic structure and promote sustainable development. Under the guidance of the dual-carbon target, many fields such as energy supply and consumption patterns of energy supply, industrial upgrading and consumption mode are undergoing profound changes. As an important link to reduce carbon emissions, the importance of green and low-carbon consumption is becoming increasingly prominent and attracting more and more attention.

2. Research significance

2.1. Theoretical significance

After sorting out the existing research literature, it is found that the current research on green and low-carbon consumption is relatively rich, but the research on the promotion of green and low-carbon consumption by digital economy and its relationship with the consumption pattern under the dual-carbon target is still relatively limited. Therefore, this study focuses on how digital economy affects the green and low-carbon consumption behavior of consumers, analyzes the main problems faced by green and low-carbon consumption in the background of digital economy, and summarizes the specific mechanism of digital economy on green and low-carbon consumption mode from the perspective of communication. At the same time, the research also combines the current situation, explores the policies and measures to promote green and low-carbon consumption, and puts forward corresponding countermeasures for the existing problems. In addition, the project from two aspects of production and consumption more carefully examines the digital economy development of the influence of carbon emission intensity, to a certain extent, added the existing research on the relationship between digital economy and carbon emissions, not only to coordinate the digital economy development and carbon emissions control provides a new idea, also for carbon reduction target provides a new path.

2.2. Practical significance

At present, China is in a critical period of rapid development of the digital economy, with a relatively solid infrastructure and rich human resources, and the future development potential of the digital economy is huge. At the same time, however, the issue of carbon emissions also needs to attract our high attention. In the face of the far-reaching impact of climate change on urban natural ecosystems and economic systems, in-depth research on how the digital economy can effectively reduce car-

bon emissions will not only help improve the resilience of cities to tackle climate change, but also provide new policy suggestions and development perspectives for the government to achieve the two-carbon goals. In addition, this research can also lead producers and consumers to adopt more standardized behavior and promote the transformation and development of a low-carbon economy.

3. Domestic and foreign research status and development trends

3.1. The Connotation of the digital economy

As global warming and environmental pollution become increasingly serious, promoting the environmental transformation of consumption patterns has become an important way to solve these problems. Green consumption as a sustainable consumption pattern aims to reduce the negative impact on the environment and promote the long-term utilization of resources. As an emerging economic form, digital economy has provided new support and impetus for green consumption with its characteristics of informatization and intelligence. The rapid development of digital technology has not only changed the traditional way of economic operation, but also brought more choices and convenience to green consumption. Therefore, the coordinated development of digital economy and green consumption has become an important way to achieve the sustainable development goal.

By summarizing the relevant research results at home and abroad, the mechanism of the coordinated development of digital economy and green consumption can be refined, including the following aspects:

The first is the mechanism of mutual promotion: the digital economy and green consumption. Through technological innovation and digital transformation, the digital economy provides more convenient choices for green consumption. For example, e-commerce platforms have more diversified the sales channels for environmentally friendly products. At the same time, the increase in the demand for green consumption has also promoted the further development of the digital economy, forcing enterprises to strengthen environmental protection and sustainable development measures in product design, supply chain management and other aspects.

The second is the driving mechanism of innovation and transformation: the development of the digital economy not only provides an opportunity for innovation, but also provides more innovative solutions for green consumption. The application of digital technology has made green consumption more convenient and personalized, such as the popularity of smart home and smart energy management systems. At the same time, the growth of green consumer demand also promotes enterprises to carry out technological innovation and business transformation, and promotes the digital economy to a more environmentally friendly and sustainable direction.

The third is the data-driven optimization mechanism: the coordinated development of digital economy and green consumption can rely on the data-driven optimization mechanism. Through big data analysis, consumer needs and behaviors can be more

accurately understood, so as to provide personalized green consumption recommendations and services. At the same time, the development of digital economy can also optimize resource utilization through data analysis, reduce energy consumption, reduce carbon emissions and so on.

Finally, the synergistic effect of policy guidance and market mechanism: policy guidance and market mechanism play a vital role in the process of the coordinated development of digital economy and green consumption. By formulating corresponding policies and regulations, such as preferential tax policies and green standards, enterprises and consumers can be guided to the development direction of green consumption and digital economy. At the same time, the establishment of a sound market mechanism will help to promote the effective connection between supply and demand, and promote the coordinated development of digital economy and green consumption.

3.3. Research dynamics

The research on green economy and green consumption has been a hot research at home and abroad, and is also penetrating into different fields. First, the research on green consumption. Luo Mingjie (2020) believes that green consumption in the context of the new era is a new consumption model characterized by the Internet. Feng Ye (2020) believes that the consumption mode guided by the concept of green development is green consumption. At present, there are still problems in the development of green consumption in China, such as weak awareness of green consumption, low level of green consumption and lack of green consumption channels. In the future, it should be optimized by increasing residents' income, innovating green logistics, and strengthening the publicity of green consumption. Bai Guanglin (2019) believes that green consumption, as a consumption mode covering the whole process of consumption, only when consumers have the correct cognition that green consumption is a positive and healthy consumption, can there be a change of green consumption attitude and the practice of green consumption behavior. Second, the research on the influencing factors of green consumption. Wang Yun (2022) believes that the change of Chinese residents' consumption is gradually changing to the direction of structural optimization, level improvement and green consumption, and the main factors influencing the implementation of green consumption by Chinese residents are residents' income, consumption willingness, development of digital technology and national cultural confidence. Xiong Ping (2022) believes that under the target of carbon peak, the influencing factors of green consumption level of Chinese residents can be divided into two aspects: themselves and external environment. In terms of external environment, the price of green industry and logistics efficiency are the main influencing factors. However, Xiuli (2020) believes that the green consumption behavior and level of Chinese residents are mainly affected by age, region and information sources, and the green consumption behavior of residents will produce regional effects and have an impact on adjacent areas. Third, the

research on the impact of digital economy on green consumption. Scholars believe that the digital economy has an impact on residents' green consumption through both direct and indirect channels. In terms of direct channels, for example, Gao Zhenjuan (2021) and Shi Hongjing (2023) agree that the digital economy can directly promote the upgrading and development of green consumption. In terms of indirect channels, Jin Yu (2021) and Zou Tong (2022) believe through research that digital economy boosts residents' green consumption through indirect channels such as digital technology, digital industry and unified digital market. To sum up, Chinese scholars have studied the relationship between digital economy and residents' green consumption level from different perspectives, which lays a theoretical foundation for this paper. However, the existing studies have not been empirically studied with Anhui Province as a specific region. Based on this, this paper takes Anhui Province as an example to study the influence mechanism and coordinated development of digital economy on the low-carbon green consumption level, and then puts forward the strategy to promote the upgrading of the green consumption level of residents.

4. Research objectives and main contents

4.1. Study objectives

The purpose of this paper is to explore the current situation, existing problems, interactive mechanism and interactive potential of green economy and green and low-carbon consumption in Anhui province of Anhui Province, and finally put forward the goals and countermeasures to realize the coordinated development of green economy and green and low-carbon consumption in Anhui Province. Research focus on the development of green economy and green low carbon consumption measure and the coordination degree, through the above measures can reflect the province green economy and green low carbon consumption in what degree, and the interaction between the development in what level, to decide how to under the condition of limited resources quickly and effectively realize the province green economy and green low carbon consumption coordinated development, synchronous development, sustainable development.

4.2. Main contents

This paper mainly adopts the coupling development model analysis of the relationship between green economy and green low carbon consumption, based on double carbon background, based on the research of parts of Anhui province, through the index system of coupling development model, using the coupling development model analysis of green economy and green low carbon consumption coupling coordination, using the gray correlation method, analysis of other influencing factors, and analyze the coupling mechanism of the development of the two and put forward countermeasures and Suggestions.

5. Theoretical analysis

5.1. Research ideas

The characteristics of green economy, green and low-carbon consumption and related concepts are defined and summarized, and then the contents of coupled development theory and collaborative theory are sorted out to provide theoretical support for the paper.

5.2. Statistical measures

Mainly using the empirical research data of Anhui Province, combined with the green economy and green low-carbon consumption data of Anhui Province, through the establishment of coupled development index system, using the development level of coupled development model analysis and the specific situation of coupled development of the two. Use the gray correlation method to analyze the correlation between green economy and green low-carbon consumption on the coupling and coordination degree, and find the main factors affecting the coupling system.

5.3. Results analysis and enlightenment

Through empirical measurement, the paper focuses on the coupled development of green economy and green and low-carbon consumption under the background of two-carbon analysis. On the one hand, from the perspective of favorable impact, green economy and green and low-carbon consumption development are opportunities, which can actively promote the development of green economy and market development. On the other hand, from the perspective of adverse effects, it is a threat. There are limitations in the coordinated development of green economy and green and low-carbon consumption and their own weaknesses. Failure to effectively solve the development dilemma will restrict the coordinated development of green economy and green and low-carbon consumption.

5.4. Results analysis and countermeasures

First, residents generally have a weak sense of green and low-carbon responsibility. Although most consumers theoretically agree with the importance of green and low-carbon consumption for environmental protection and sustainable development, the awareness of low-carbon responsibility is still relatively weak in the actual consumption decisions. Many consumers give priority to price, brand and quality when choosing products, but pay less attention to low-carbon indicators such as environmental labels and carbon footprints of products. Especially in price-sensitive situations, consumers tend to choose ordinary goods with lower prices rather than green and low-carbon products. Second, the lack of green and low-carbon consumption knowledge survey. Many consumers know less about green low carbon consumption, especially in the carbon footprint, green label, energy conservation and emissions reduction concept cognition is very limited, most consumers cannot accurately understand the green products promised environmental effect and specific

meaning, which makes them lack of sufficient information support. Third, the herd mentality influences the green and low-carbon consumption behavior. The influence of the herd mentality in the green and low-carbon consumption cannot be ignored. Consumers tend to make choices based on the consumption behavior of their friends and friends or the popular consumption trends on social media, rather than based on their own independent understanding of the green and low-carbon consumption concept. Fourth, there are difficulties in the green product market. The market dilemma of green products are mainly reflected in the high price, limited supply channels and lack of product choices. First, green and low-carbon products are usually priced higher, mainly due to the high cost of environmentally friendly materials and technologies in the production process, and consumers often struggle to bear this additional cost, especially for low-income groups. At the same time, the supply channels of green products are still insufficient. It is difficult for consumers to easily find products that meet the green standards in traditional supermarkets, e-commerce platforms and other channels, and the types and choices of green and low-carbon products are also limited. In addition, the certification standards for green products in the market are not unified, making it difficult for consumers to identify which products truly meet the green standards, which further affects their purchase intention.

However, according to the research results, green and low-carbon consumption has made some progress. For example, the government's guiding policies and the gradual improvement of the market of green and low-carbon products, there are still some drawbacks, such as residents' lack of low-carbon responsibility and lack of knowledge of green consumption. Therefore, although our country has taken important strides in promoting green low carbon consumption, but to achieve the goal of "double carbon", the development of green low carbon consumption also need to continue optimization and improvement, facing many challenges, the future still need to improve policy, market guidance, consumer education efforts, promote the popularization of green low carbon consumption.

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