

Research on the Basic Theory and Connotation Definition of Green Economic Efficiency

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Abstract

The extensive development method at the expense of resources and the environment has not only brought high-speed economic growth to China, but also brought huge pressure on resources and environment, which results in a continuously deteriorating ecological environment, and unsustainable development. It becomes difficult to accord with the needs of current economic development. The development of green economy is not only the need for China to realize the transformation of economic growth, but also the environmental need to ensure the improvement of people's living conditions, which has important practical significance for achieving high-quality economic development. Therefore, the improvement of green economic efficiency is imminent. From the perspective of theoretical research, this paper deeply summarizes the basic theories of green economic efficiency, and on this basis, deeply explores the basic connotation of green economic efficiency, and provides theoretical support for China to vigorously develop green economy and achieve green economic efficiency improvement.

Keywords

Green economic efficiency; Basic theory; Connotation definition.

1. Introduction

For a long time, mankind has been constantly sacrificing the environment in exchange for short-term economic growth. This inability to achieve long-term and stable growth has brought immeasurable consequences to mankind. Therefore, in order to realize the healthy and sustainable development of mankind, it is necessary to realize the coordinated development of environmental protection and economic growth. China's early economic development also adopted an extensive growth method at the expense of resources and the environment. Although the total economic volume is the fastest growing economic entity in the world, this high-input, high-emission, and high-polluting development method has caused China to be extremely inefficient in resource utilization. The consequent tightening of resource constraints, ecosystem degradation, and serious environmental pollution pose serious threats to the sustainable development of China's economy. The development of green economy in this context is of great significance for transforming the economic growth mode and achieving sustainable development. The key to the development of green economy is to improve green economic efficiency, that is, to improve the quality of economic growth while increasing the economic volume. Green economic efficiency is an important indicator to measure the level of coordinated and sustainable development of regional economy and resources and environment, so what are the basic theories of green economic efficiency? What is the meaning of green economy efficiency? Existing research has carried out systematic analysis and research on the basic theory and connotation definition of green economic efficiency, but it has not yet formed a unified and clear definition. In this context, this research attempts to explore the basic connotation of green economic efficiency from the perspective of theoretical research based on the analysis of the basic theory of green economic efficiency, and provide theoretical support

for the development of China's green economy and the improvement of green economic efficiency.

2. The Basic Theory of Green Economic Efficiency

2.1. Circular Economic Theory

The concept of circular economy was first proposed by American economist Boulding [1]. Afterwards, many scholars deepened the concept of circular economy and further developed the circular economy. Circular economy, as a sustainable development model that achieves efficient use of resources, is based on resource recycling and effective utilization, with the goal of protecting the ecological environment, the basic characteristics of low consumption, low emission, high efficiency, and the realization of resource reuse and recycling. The traditional economic development model has drawbacks in the mechanism, so it is difficult to correctly and efficiently handle the relationship between the economic system and ecological system, which causes contradictions between the two. Therefore, the circular economy is based on a new perspective to solve the problem of the synchronization between the speed of economic development and the speed of environmental protection technology, so as to introduce the technical and economic paradigm into the circular concept, and promote the integrated development of the ecosystem and economic society.

The main characteristics of circular economy: First, the main body of circular economy is the circulation of materials. Circular economy can help reduce pollutant emissions in the process of material recycling, thereby building a sustainable development model. Second, the circular economy is strategic. Circular economy believes that a large amount of production resources cannot be consumed for short-term gains, and irreversible damage to the ecological environment must be focused on long-term gains. The third is that the circular economy is comprehensive. The comprehensiveness of circular economy means that in the process of economic development, not only must pay attention to the ecological environment and economic growth, but also the social development model, technology, culture and other factors, so as to incorporate all the elements that can promote the sustainable development of economy into the analysis framework.

2.2. Low-carbon Economic Theory

At the beginning, the British government proposed in the white paper 'Our Future: Creating a Low-Carbon Economy' that a low-carbon economy, a new economic development model, is based on low energy consumption, low emissions, and low pollution, and aims to achieve economic, social, and environmental benefits. The low-carbon economy not only improves the quality of human life, improves the social and ecological environment, but also accelerates the effective circulation of advanced technologies around the world, and promotes the development of all mankind. With the continuous development of human society, the connotation of low-carbon economy is constantly enriched, but so far there is no consistent definition. At present, the international community defines low-carbon economy as: based on the concept of sustainable development, through various methods such as institutional innovation, technological innovation, and industrial transformation, to reduce the consumption of high-carbon energy as much as possible.

The low-carbon economy mainly includes several aspects: (1) Based on the perspective of energy utilization, low-carbon economy emphasizes the transformation from fossil energy to renewable energy. (2) From the perspective of industrial upgrading, low-carbon economy is based on low-carbon industries and low-carbon technologies, and through increased R&D investment, energy efficiency is improved, and the industrial structure is optimized. (3) From the perspective of technological progress, the essence of low-carbon economy is to increase

energy efficiency. The core is to reduce the proportion of fossil energy consumption and reduce damage to ecological environment through institutional innovation, technological innovation, and organizational innovation. (4) Based on the perspective of institutional innovation, low-carbon economy is the use of efficient institutional arrangements to solve the institutional problems of low-carbon economy.

2.3. Ecological Economic Theory

In the 1980s, ecological economics as an emerging discipline received widespread attention. Costanza [2] believed ecological economics is an important discipline that explains the relationship between ecosystems and economic systems. The research object of ecological economics is ecological economic system, of which researches mainly have three characteristics: The First is the integrity. Ecological economics can become a complete system discipline only if the ecological system and economic system are integrated into an organic whole. The second is strategic. In the development process of ecological economic system from quantitative change to qualitative change, only with a long-term strategy can it avoid irreversible effects on the ecosystem and future generations when it achieves qualitative change. The third is comprehensiveness. Ecological economic system involves multiple levels of life system, environmental system, etc., and is a complex comprehensive system.

Western ecological economics mainly studies its sustainability. Daly [3] studied the economic system as a subsystem of ecosystem in analyzing the interaction mechanism between the economic system and ecosystem. Therefore, only by recognizing that the economic system is a part of ecosystem can the economic growth be restricted to the ecosystem, so as to achieve the coordinated development of economic system and ecosystem. The main theory of Chinese scholars is that ecology and economy should develop in a coordinated manner. Specifically, they mainly include the following theories: The first is the dual existence theory of ecology and economy. This theory believes that one-sided pursuit of economic benefits while ignoring ecological protection will cause serious damage to the ecosystem. Therefore, only by ensuring the dual existence of economy and ecology can we promote the sound and rapid development of economic system. The second is the economy-led and ecological-based theory. This theory holds that only by putting the economic system first can solve a series of social problems. The third is the unified theory of economic, ecological and social benefits. This theory holds that ecological economic system is an organic combination of ecological system and economic system, ecological economic balance is a combination of ecological balance and economic balance, and ecological economic benefit is a combination of ecological and economic benefits.

2.4. Environmental Economic Theory

With the rapid development of world economy, environmental quality has further degraded, and the trade-off relationship between environment quality and economic quality has become a hot issue for environmental economists. As the problem of environmental pollution continues to increase, people apply the Kuznets inverted U curve to the relationship between the environment and economy, and put forward the hypothesis of the environmental Kuznets curve. The hypothesis points out the environmental quality has an inverted U-shaped trend that deteriorates first and then improves with economic growth.

At present, environmental Kuznets theoretical research mainly focuses on technology, economic structure, resource cost and national policy. Stokey [4] used the endogenous growth model to study the environmental Kuznets curve and found that with the rapid development of economy, the environmental quality showed a trend of first deterioration and then improvement. Grossman [5] believes that the environmental Kuznets curve is the result of dual effects of scale and structure. According to the environmental Kuznets curve theory, there is a positive correlation between economic growth and energy consumption, which means economic growth will drive an increase in energy consumption. If effective emission reduction

measures are taken, it may achieve better results with lower energy consumption. This process is called 'decoupling'. The decoupling theory believes that if a country or region's economic development does not come at the cost of environmental degradation, that is, its energy use and environmental costs do not increase with economic development, then there is a decoupling relationship. On the contrary, a country or region's economic development comes at the cost of environmental degradation, It is a coupling relationship. Regarding the decoupling of economic growth and environmental quality, we need to pay attention to the following two issues: First, decoupling is an ultra-long-term process. Without the interference of external factors, as the process of industrialization accelerates, the resistance to the decoupling of China's economic growth and carbon emissions will continue to increase, and decoupling may take a hundred years. Second, the decoupling process must save resources and maintain economic growth. Simultaneously carry out carbon reduction. From a theoretical point of view, the decoupling theory and the principle of the Kuznets curve are consistent.

2.5. Sustainable Development Theory

Based on different research perspectives, scholars in different countries have quite different understandings of sustainable development. Kummer et al. [6] believed that sustainable development focuses on the sustainability of economic development. Clark et al. [7] believed that it focused on the sustainability of the natural environment. Brown et al. [8] believed that sustainable development was the sustainability of human social development. Taken together, the discussion on sustainable development mainly includes the following viewpoints: First, sustainable development was the common goal of all mankind. Barbier [9] believed that an important way to ensure the survival and development of human beings was that the economy and population size must be controlled to the extent that only renewable resources could meet the needs of human production and life. Coastanza [10] believed that sustainable development was a dynamic equilibrium relationship between economic growth and ecosystem evolution. Second, the core of sustainable development was to ensure the fairness of human beings between generations. Third, the key to sustainable development is to seek stable economic, social and environmental development. Sustainable development is the dynamic adaptation process of the economic system in the evolution of the ecosystem, and this dynamic adaptation process is conducive to the evolution of the economic system gradually tending to a stable state. As the international community continues to study sustainable development models, the models of sustainable development can generally be divided into four categories: The first category is the ideal model. The ideal model of sustainable development believes that human beings survive under certain ecological constraints, and the economy cannot expand unrestrictedly. Strict control of the growth of human numbers and economic development is the basis for ensuring the sustainable development of mankind. The second category is the common development model of economy and environment. This model focuses on the sustainable development of economy and introduces the maintenance of ecosystem into economic system. The third category is the ecological development model. The ecological development model believes that the prerequisite of human development is ecological environment, so it must be adjusted according to the environment in the process of economic development. The fourth category is the economic growth development model. This model believes that the policy goal of promoting sustainable development is still economic growth.

3. The Connotation Definition of Green Economic Efficiency

Before defining green economic efficiency, we must first clarify the connotation and definition of economic efficiency. Economic efficiency is usually abbreviated as efficiency in economics, and it is widely used in the study of economic theory. However, due to its extensive application, scholars have different views on the definition and connotation of economic efficiency, and

have not yet formed a consensus view. Pareto believes that the efficiency of resource allocation is the allocation of resources in a certain kind of economy, so that everyone in the economy is at least as good as the initial situation, and at least one person is better than the initial situation, the allocation efficiency is the highest, which is also known as 'Pareto efficiency' [11]. Samuelson believes that economic efficiency means that efficiency does not produce waste [12]. To sum up, the economic efficiency studied in this article means that in economic activities, the maximum output is achieved under a given input, or the input is minimized under a given output, then economic activities are effective.

The term 'green economy' was first proposed by economist Pearce in 1989. Afterwards, scholars at home and abroad have successively discussed and analyzed the concepts related to green economy, and obtained certain research results. Compared with traditional economic development methods, green economy focuses on how to coordinate the contradiction between resource scarcity and human social and economic development needs, and solve the external diseconomy caused by economic activities on resources and the environment. Domestic research on green economy started late but developed rapidly, such as Yan [13], Yu [14], Yang [15], Ke [16], etc., expounding the understanding of the concept of green economy from multiple angles. Existing studies have shown that green economy can be divided into broad and narrow senses. Green economy in narrow sense refers to the coordination of economic growth, resource conservation and environmental protection in social production, which is a new development model that combining the realization of high economic efficiency and environmental rationality. Therefore, this article believes that green economic efficiency is a true 'green' economic efficiency value, which combines economic efficiency and the narrowly defined concept of green economy, considers resource consumption and environmental pollution into actual economic activities, reflects whether the economic activities effectively use resources and reduce environmental pollution.

4. Conclusion

Green economic efficiency research is still a hot research topic, and it is necessary to fully understand the basic theory of green economic efficiency and its conceptual definition. Green economic efficiency, a true 'green' economic efficiency value, is based on circular economy theory, low-carbon economy theory, ecological economy theory, environmental economic theory and sustainable development theory, refers to the fact that resource consumption and environmental pollution are taken into account in actual economic activities, reflects whether economic activities are effective including utilizing resources and reducing environmental pollution. In addition, this work is supported by General Project of Natural Science Research of Colleges and Universities of Jiangsu Province (20KJB630015).

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