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The Relationship between Low Carbon Economy and China's Social Economic Structure

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Abstract

Low-carbon economic development is characterized by low resource and energy consumption and low environmental pollution.This model has received enthusiastic response from all walks of life since it was first proposed in 2003. Since its development, the low-carbon economy has been gradually applied by many countries in the world. At this stage, China's market economy has achieved vigorous development, but it has been accompanied by serious environmental problems. At present, China's environment is showing a vicious development trend, which has seriously hindered the healthy development of the market economy. Therefore, China's economic development model has also begun to transform to a low-carbon economy. Only by fully implementing the low-carbon economic development model can China effectively reduce the level of environmental pollution and promote the long-term development of China's economy. By comparing the correlation between low-carbon economic development and social economic structure in ten coastal cities and ten inland cities in China, this paper proves the promotion role of low-carbon economy in the upgrading and transformation of social economic structure.

Keywords

Low-carbon Economic; The Economic Structure; Transformation.

1. Literature Review

1.1. The Main Concept of Low-carbon Economy

As an economic term, "low-carbon economy" aims at sustainable development and changes the old-style industrial development mode with high pollution by developing new energy sources. In order to promote social and economic development at the same time, the ecological environment is also protected. The term "low-carbon economy" first appeared in the UK's energy white Paper in 2003. The first industrial revolution not only promoted the rapid economic development of The UK, but also brought severe tests to the UK's ecological environment and climate change.Without industrial transformation and upgrading, the country has been relying on a high-emission industrial economy to boost its income.By 2020, the British government expects the country to import 80% of its energy.If it has been dependent on energy imports, but if international conflict breaks out, it will have a serious impact on the UK's economic development.

At that time, the smog in Britain was also serious, and the sky over London was often dark.It has caused serious harm to people's health and caused frequent respiratory diseases.And the industrial economy leads to huge amounts of industrial waste being discharged into the air and soil, as well as into rivers.The safety of food crops and drinking water is seriously endangered. The essence of social and economic development is to enable people to have a better life.But if people's health suffers as a result of economic development, the gains are outweighed by the losses.However, the consumption of natural resources to promote economic growth will only lead to economic stagnation or even regression when natural resources are exhausted.

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Therefore, China's economic development model should also actively transform to a low-carbon economy, fully implement a low-carbon economic development model, protect the natural environment on which people depend, and promote the coordinated development of people, nature, and society.

1.2. The Practical Significance of Low-carbon Economy

Global warming has seriously restricted the economic and social progress of the world, and China also has similar social problems in the process of development.The low-carbon economic development model is a new social development model promoted by governments all over the world in recent years.This way of economic and social development is mainly pointed out that governments around the world should vigorously carry out low carbon way, to create good laws to promote the development of the model and the economic and social environment, and further to focus on low carbon technology and the development of the commodity, so as to expand the scope of the concept of low carbon, in order to effectively cope with the problem of global warming.The core concept of low-carbon economic development mode can also be summarized as: the most economical and environmentally friendly low-pollution economic development mode can bring huge economic and social benefits to enterprises, so as to achieve the synergy of environment, economic society, and scientific and technological progress. The speed of China's economic development is increasing year by year.Especially in recent years, the acceleration of urbanization has led to essential changes in people's production and life style.However, the development of such a high-speed economic model is at the expense of environmental protection.Due to the rapid development of the socialist market economy, China's low carbon emissions are still very high, and the pollution to the natural environment is also increasing, which has become a fundamental factor restricting China's transition to low-carbon economic development mode.

1.3. Main Features of a Low-carbon Economy

Low-carbon economic development model emphasizes "low carbon ", that is, reducing carbon dioxide emissions, and reducing carbon emissions will inevitably bring economic pressure. By comparing the impact of relevant experts and scholars on carbon emissions that affect the classification and degree of various factors, we can know that the main driving factor is the increase of various industrial production factors, which leads to the increase of carbon emissions in the same proportion as GDP. Therefore, the increase and decrease of carbon emissions also affect the development of economic society.After the economic transformation, the growth rate of China's average GDP will inevitably decline, and the economic scale will change from speed to quality.In this case, China's economic development is bound to cause a huge transformation pressure.

2. Pressures and Difficulties Faced by China Slow-carbon Economic Development

2.1. The Relationship between Industrial Production and Carbon Emissions

Low-carbon economic development model emphasizes "low carbon ", that is, reducing carbon dioxide emissions, and reducing carbon emissions will inevitably bring economic pressure. By comparing the impact of relevant experts and scholars on carbon emissions that affect the classification and degree of various factors, we can know that the main driving factor is the increase of various industrial production factors, which leads to the increase of carbon emissions in the same proportion as GDP. Therefore, the increase and decrease of carbon emissions also affect the development of economic society. After the economic transformation, the growth rate of China's average GDP will inevitably decline, and the economic scale will

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change from speed to quality. In this case, China's economic development is bound to cause a huge transformation pressure.

2.2. Restriction of Industrial Production Structure

In world trade and economic cooperation, the foreign trade of China's export products most for labor-intensive and resource-intensive products, so the production process of this commodity is usually spent enormous material resources, and produce a large number of environmental cost, this not only weakened China's competitive position in the global market, will directly increase the environmental pollution and energy consumption. In the process of China's low-carbon economic development, China's industrial structure has always occupied a key strategic position. However, the distribution of China's industrial structure is still relatively uneven. The traditional labor-intensive and resource-intensive industrial structure still dominates the whole Structural market in China. This industrial structure constantly wastes and consumes social energy and resources. But at the same time, it also reduces the overall development level of low-carbon economy, which will have an important negative impact on the application and development of low-carbon economy. Therefore, if China wants to develop low-carbon economic model rapidly, it needs to adjust China's industrial structure reasonably on the basis of long-term harmonious economic and social development, so as to promote the rapid transformation of China's economy and society to low-carbon economy. Since the reform and opening up, China's market economy has developed, and ecological energy consumption and carbon dioxide emissions have risen correspondingly. Among them, the chemical industry consumes about 80 percent of Japan's ecological energy and releases 84 percent of its carbon dioxide. As a result, China's industrial structure has been adjusted. This has become the primary mission of China's booming low-carbon economy. If China wants to transition to a low-carbon economy, it must form a low-carbon economic development model in China to reduce carbon dioxide emissions, which will inevitably change the industrial structure. By changing the traditional industrial technology, energy-saving production methods and manufacturing technologies will be further developed rapidly. The modernization of production methods and manufacturing equipment to meet the needs of new industries, so as to achieve low-carbon goals, and thus alleviate the pressure of economic transformation brought about by China's industrial restructuring.

2.3. Pressure from Backward Low-carbon Technology

Low-carbon technologies are also a major driver of mitigating the greenhouse effect and solving the weather problem. For example, the transportation department and civil units can promote the research and development of energy-saving technology and create new energy-saving products, and the economic saving effect can be increased by more than 1.5 percent. In this context, it makes sense to shift to a low-carbon development model that relies on power-saving technology and manufacturing efficiency. According to Fan's statement, China would still have to emit 15.1 billion metric tons of carbon dioxide by 2020 based on current industrial production technologies, but the world's emissions should still be limited to 40 billion tons by 2020, according to the global carbon control body. At that time, China still has 4.7 billion tons of carbon dioxide has not been discharged. Therefore, we need to further understand our national conditions, improve industrial production technology and carbon emission management skills, to adapt to the threat of technological transformation and upgrading. Low carbon technology backwardness is an objective factor that restricts China's transition to low carbon economic development mode. In Fan's view, to truly achieve a low-carbon economic development model, we need to use world-leading technology. In the aspect of industry, China often only pays attention to how to achieve production development through energy consumption, but does not fully pay attention to the research and development of science and

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technology. As a result, China has been far behind other developed countries in the development of new energy and new manufacturing technology, which also limits the speed.

3. Theoretical Analysis and Research Hypothesis

3.1. The Direct Impact of Low-carbon Economic Development on China's Economic Structure

It helped Transform China from an old industrial economy into a modern knowledge economy. Heavy industry declined significantly and the service sector developed rapidly. Due to the needs of low-carbon economic development, modern high-tech technology is developing rapidly. Greatly reducing the ecological environment pollution caused by the past heavy industry. And modern information technology brings far greater economic returns than heavy industry. At the same time, it also reduces the harm degree of the working environment to employees' health. According to China's 12th Five-Year Plan, "by 2020, carbon dioxide emissions of GROSS domestic product should be reduced by 40 to 45 percent from 2005 levels". Based on the national policy to strongly support the development of low-carbon economy, a series of new low-carbon enterprises mushroomed. Take, for example, the popularity of bike-sharing in China. Greatly changed the way people travel, so that low-carbon life into every corner of society. Because people's strong support for low-carbon economy, to a large extent promoted the rapid development of low-carbon economy. In the two sessions in 2010, ecological environmental protection and sustainable development became the theme of the two sessions, and the "No. 1 Proposal" of the CPPCC national Committee is about low carbon environmental protection. In his report on the work of the Government, Wen pointed out that the international financial crisis is giving birth to a new scientific and technological revolution and an industrial revolution. To develop strategic emerging industries and seize the commanding heights of the economy, science and technology determine the country's future. We must seize opportunities, identify priorities, and make significant progress. We will vigorously develop new energy, new materials, energy conservation, environmental protection, bio medicine, information networks, and high-end manufacturing industries. (Weng,2010).

3.2. Low Carbon Economic Development and Linear Characteristics Analysis of China's Economic Structure

Low carbon economic development can effectively break the constraints caused by the limited supply of natural factors of production on social and economic development. The promotion effect of improving scientific and technological factors of production on China's economic growth. Low-carbon economy will promote the transformation and upgrading of production modes. From resource-consuming, labor-intensive production mode with less added value to a new production mode with high technology content and less resource consumption. And in China's eastern coastal cities, such as Shanghai, Beijing, Hong Kong. These metropolises with high-end economic structures are mainly tertiary industries. It mainly develops financial industry, tourism and service industry, and is the center of scientific and technological development and innovation. Industrial policies in these regions are mostly low-carbon oriented. As a large city in China, it attracts many residents. The increase in urban population has prompted the local government to strengthen the development of low-carbon economy. Vehicle restrictions, increased loans, reduced interest rates to promote the introduction of new energy vehicles. Government policies and public welfare publicity have promoted people's purchase of low-carbon products. This has stimulated the desire of local research institutes such as “Zhong guan cun” to develop low-carbon technologies. Develop more high-tech and low-carbon products. This has formed a double cycle of "economic development" and "ecological environment". On April 11, 2022, General Secretary Xi Jinping paid a field trip to Hainan. The

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importance of ecological and environmental protection was emphasized. A good ecological environment can not only protect people's health, but also promote the development of tourism and service industry. Thus we can see the linear correlation between low carbon economy and social economic structure. Therefore, the main reason affecting China's economic and social transition to low-carbon economy is the lag of low-carbon environmental protection technology. In the process of production, while most companies only through the use of a great deal of energy resources consumption to increase production output, but for high efficiency and low energy saving technology research has failed to give sufficient attention, which makes our country's energy conservation and emissions reduction technology lagging behind in other countries, has seriously restricted the our country economy to a low-carbon economy for further change.

4. Empirical Study Design

4.1. Model Specification

For hypothesis , this paper constructed the following basic OLS regression model:

$$Estruct\ ht = \alpha\ 0 + \alpha\ 1\ LowC\ ht + \mu\ i \quad (1)$$

Where, Estruct ht is the indicator of social and economic development structure of Chinese city h in t period, LowC ht is the low carbon economic development level of city h in t period, μ i represents the individual fixed effect of city h that does not change with time.

4.2. Variable Measure and Specification

4.2.1. Explanatory Variables

This paper measures the development level of low-carbon economy based on China Development Index (RCDI2021). China development Index can be used as an effective index to analyze the development trend of low-carbon economy. Meanwhile, the development rate of low-carbon economy can also be analyzed by exponential growth rate. At the same time, the relationship between sulfur dioxide emissions per 10,000 yuan of GDP and China's development indicators is used to measure the development speed of regional low-carbon economy. (Peng,2010)The first is "carbon dioxide emissions per unit of energy consumed ", also known as" energy carbon intensity ".This index is related to the quality and efficiency of energy.For example, China currently takes coal as the main energy source, with relatively high energy structure and high carbon emissions per unit of energy.In the future, with the increase of geothermal power generation as the main renewable energy and the conversion of coal to natural gas, and the development of renewable energy technologies such as wind, solar, hydropower, and nuclear power, carbon dioxide emissions per unit of energy consumption will gradually decrease.Second, energy consumption per unit of GDP, also known as energy intensity.In the early stages of industrialization, this index will increase, and with the increase of mechanization due to the change of industrial structure, and the gradual elimination of backward productivity and optimization of process equipment, energy intensity will also become a trend of gradual decline.So, in the long run, a country.In the early stages of industrialization, household energy consumption per unit of GDP will rise sharply.If industrialization is successful, if it is profitable, there will be a downward inflection point for a considerable period of time.And the third factor is "co2 emissions per unit of GDP ", also known as" carbon intensity ".This index is an important index that can be used to measure whether carbon emissions are directly related to a country's economic development and carbon emissions.Energy per unit and carbon dioxide emissions per unit.The role of GDP and fuel consumption also directly affects the level of carbon intensity.

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4.2.2. Explained Variable

This paper decides to adopt the industrial economic structure;Labor force structure index;Proportion of total industrial output value;Hoffman scale index.The binary comparison index is the absolute value of the difference between the share of secondary, tertiary or non-agricultural output and the share of the general workforce.So the binary contrast index is theoretically between zero and one.Contrary to the binary comparison coefficient, when the larger the comparison index is, the greater the difference between the primary and secondary industries, and the tertiary industries, the more prominent the economic duality is.When the comparison index is zero, dual economy is transformed into a single economy, and duality disappears.It can reflect the composition of regional industrial structure very well.Then, the labor input index of unit commodity production is used to reflect the average working time of labor for each unit product.Labor productivity is usually described by product and labor input.Thus shows the production technology content of the industry. Hoffman ratio illustrates the regularity of industrial structure development of a country or region in the process of industrialization.This paper expounds that the industrial structure is transforming from the main body of the second industry to the third industry due to the development of people's social productivity and the rapid development of economic civilization, especially information technology, and puts forward the definition of "central need" and "final need".

5. Empirical Findings

5.1. Benchmark Regression of Low Carbon Economy and Socioeconomic Structure

In this paper, the ordinary least squares method is used for 10 coastal cities and 10 inland cities. The research on the social and economic structure changes caused by low-carbon economic development is carried out, and the specific results are shown in Table 1 and Table 2. It can be seen from the Coefficient and cons that the social and economic structure of coastal cities with better low-carbon economy development is better than that of inland cities with developed manufacturing industries. Therefore, the development of low-carbon economy can promote the transformation and upgrading of social and economic structure.

Table 1. Benchmark regression results of low-carbon economic development and socioeconomic structure (10 coastal cities)

```
. regress thecoastalcitygdp lowcarboneconomy
```

Source	SS	df	MS	Number of obs	=	20
				F(1, 18)	=	3277.20
Model	2.5726e+09	1	2.5726e+09	Prob > F	=	0.0000
Residual	14129952.9	18	784997.384	R-squared	=	0.9945
				Adj R-squared	=	0.9942
Total	2.5867e+09	19	136143402	Root MSE	=	886

thecoastalc~p	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
lowcarbonec~y	1.264127	.022082	57.25	0.000	1.217735	1.31052
_cons	3623.017	375.1732	9.66	0.000	2834.808	4411.227

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Table 2. Benchmark regression results of low-carbon economic development and socioeconomic structure (10 inland city)

```
. regress InlandcityGDP Lowcarboneconomy
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Source	SS	df	MS	Number of obs	=	14
				F(1, 12)	=	370.59
Model	293977152	1	293977152	Prob > F	=	0.0000
Residual	9519294.79	12	793274.565	R-squared	=	0.9686
				Adj R-squared	=	0.9660
Total	303496447	13	23345880.5	Root MSE	=	890.66

InlandcityGDP	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
Lowcarboneconomy	1.466716	.0761905	19.25	0.000	1.300711	1.632721
_cons	1895.063	478.4055	3.96	0.002	852.7065	2937.419

According to Table 2, in inland cities where the development of low-carbon economy is relatively backward, the degree of dispersion of the model is greater, indicating that there is still a certain room for further development to promote industrial transformation and upgrading by using the development of low-carbon economy. In order to realize the two-way interaction between economy and ecology.

5.2. Correlation Test

Based on the low-carbon economy, it can promote the transformation and upgrading of the social and economic structure and promote the research and development of high-tech. Therefore, there is a clear correlation between low-carbon economy and social and economic structure. This paper mainly discusses the effect of low-carbon economic development on the transformation of economic structure from the northeastern and central and western cities.

This article is based on the classification standard of the eastern, central and western cities by the National Bureau of Statistics. 10 coastal and 10 inland cities were selected. Table 3 shows that low-carbon economic development can promote the coordinated development of social and economic structures. Among them, from the covariance results. The growth of a low-carbon economy can significantly promote changes in the socioeconomic structure, from labor-intensive, energy-intensive enterprises to low-emission, high-tech enterprises. Effectively stimulate the healthy growth of regional GDP.

Table 3. Correlation Test (10 coastal cities)

```
. correlate thecoastalcitygdp lowcarboneconomy
(obs=20)
```

	thecoa~p	lowcar~y
thecoastal~p	1.0000	
lowcarbone~y	0.9973	1.0000

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Based on Table 4, it can be seen that the covariance of Lowcar~y and Inland~P is smaller than that of Table 3, indicating that the "dual cycle" of economic development and ecological environment is relatively weakened due to insufficient use of the development of low-carbon economy to promote the transformation of economic structure.

Table 4. Correlation Test (10 inland cities)

```
. correlate Lowcarboneconomy InlandcityGDP
(obs=14)

             | Lowcar~y Inland~P
-------------+------------------
Lowcarbone~y |   1.0000
Inlandcity~P |   0.9842   1.0000
```

6. Conclusion

Through the above analysis, the development of a low-carbon economy can effectively promote the transformation and upgrading of the social and economic structure. Only by increasing the investment in research and development of high-tech industries can we promote the effective "double cycle" of economic development and ecological environment, and achieve sustainable development. continuous development.

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