ISSN: 2688-9323

The Asymmetric Effect of the Oil Shock on the Carbon Emission Quota Price

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Abstract

Crude oil, as a basic production factor, affects carbon emissions through various channels such as production materials and energy supply in production, and then affects the carbon emission trading market. Considering the change in the relationship between oil shocks and carbon quota prices before and after China announced the establishment of a nationally unified carbon market in 2017. So how will the price of carbon quotas change under the different incentives of rising oil prices? This project intends to construct a non-linear autoregressive distribution lag model (NARDL) to study the asymmetric relationship between oil shock and China's carbon emission trading market. The NARDL model analyzes the short-term and long-term interactions between variables from the non-linear perspective, that is, the short-term and long-term interactions of oil shock on the carbon emission license price. By ting oil fluctuations to supply, demand and risk shocks, previous studies often ignore the impact of these three clear classifications of oil shocks on China's carbon quota prices. Using NARDL model to study the relationship between China's carbon emission trading market and oil market, not only can make up for the existing literature lack of oil market of carbon emission quota research, and NARDL model can also analyze the short-term and long-term role between non-linear variables, to explore the mechanism of oil impact and carbon emission quota. Through the analysis of the oil market, the impact of the oil impact on the carbon emission quota, and we hope that the research of this project can provide research ideas for the carbon emission quota market, enrich the theoretical basis of the carbon emission market, and provide practical suggestions.

Keywords

Oil Shock; Carbon Emission Quota; Asymmetric Effect; NARDL Model.

1. Introduction

Anthropogenic global warming caused by greenhouse gas emissions has attracted worldwide attention. In this regard, the carbon emission trading market can effectively promote the development of a low-carbon economy and reduce greenhouse gas emissions. As a basic factor of production, crude oil affects carbon emissions through various channels such as production materials and energy supply in production, and then affects the carbon emission trading market. However, there is still little analysis of the carbon quota price market in the case of oil price fluctuations caused by different shocks. Oil prices are rising because of more demand, but possibly also because of less supply. The same result, but for different reasons, will have different effects on oil use, leading to different carbon emissions. So how will the price of carbon quotas change under the different incentives of rising oil prices? Given the strong impact of oil prices on emissions trading markets, it is necessary to clarify the relationship between oil shocks and carbon quota prices. Oil price shocks from different sources can be divided into supply or demand-driven in different ways. A common approach is to find exogenous tools for changes in oil prices, such as time-series events that affect oil production. Other studies have identified some deficiencies in various impact decomposition methods use of oil production

ISSN: 2688-9323

data. It cannot get information about changes in oil prices slowly every day[1]. At the same time, it is unable to determine whether specific oil demand shocks are driven by concerns about future oil supply or a change in total oil demand. Overcoming these shortcomings. Break down oil changes into oil supply, demand, and risk shocks. At the same time, this decomposition method uses daily data to obtain effective information, resulting in better results than previous methods.

2. Research Meaning

2.1. Realistic Meaning

As far as China is concerned, the development process of China's carbon emission quota market is relatively short, and the relevant market system and theories are not mature enough. China's carbon emission quota is extremely unstable and affected by the impact of oil, and the research on China's carbon emission market does not reflect China's dominant influence on the carbon emission trading market. From the existing literature studies, research on carbon emission quota from nonlinear and asymmetric perspectives is increasingly common. The construction of the NARDL model can analyze the mechanism of action between nonlinear and asymmetric, given that some scholars have used the NARDL model to study the transmission of energy costs to the price of CARBON dioxide emissions in the United States. Using NARDL model to study the relationship between China's carbon emission trading market and oil market, not only can make up for the existing literature lack of oil market of carbon emission quota research, and NARDL model can also analyze the short-term and long-term role between non-linear variables, to explore the mechanism of oil impact and carbon emission quota. There is a lack of research on the long-term and short-term impacts of oil shocks and carbon emissions trading markets. Therefore, it is of great theoretical significance to study the impact of oil shock on carbon emission quota.

2.2. Theoretical Significance

China's agricultural economic products can not be among the forefront of the world, and China's lack of agricultural products market competitiveness has a greater relationship. The development of rural cooperative economic organizations can expand the scale of production through cooperation and cooperation. The current situation of China's rural economy is inconsistent with the national conditions of western countries, which can not be deliberately imitated or copied. It should be explored in combination with its own national conditions. Agricultural cooperative economic organizations, as the connecting hub between farmers and the market, can better provide farmers with management, finance, raw materials, information and other services. The development of rural cooperative economy needs the unified guidance of leaders and the support of farmers, which should not only give play to the key leading role of cadres, but also be combined with the pioneering spirit of farmers.

3. Research Status and Development Trends at Home and Abroad:

3.1. Research Objectives

Pearl River model " is a typical representative of China's rural areas to promote rural industrialization. The "Pearl River Model" covers 14 cities and counties in the Pearl River Basin of Guangdong Province, also known as the Pearl River Delta (the "Pearl River Delta"). The pearl river delta region of rural areas relying on the reform and opening up policy first advantage and slightly near Hong Kong and Macao location advantage, take the lead in the introduction of Hong Kong and Macao, overseas Chinese and other foreign capital and technology, make full use of labor, land elements such as "bonus", "development is given priority to with" three to fill " export-oriented township enterprises, accelerate the process of industrialization in rural areas.

ISSN: 2688-9323

In general, the effective utilization of foreign capital and the pioneering opening-up policy given by the Chinese central government are the main driving forces for the formation of the "Pearl River Model". The rural industrialization process of "Pearl River Model" is more based on the close connection with Hong Kong, China region, and driven by the central policy, it has found opportunities and aspirations for development in the division of labor system of the global trade industry chain.

3.2. Primary Coverage

This project is planned to pass the oil impact research, so as to explain the background of the topic selection of this paper, and point out the research ideas and main content of this paper, and get the corresponding research significance. Then, the current literature on oil impact is sorted out to understand the research status from an academic perspective, and to point out the reference for previous research. At the same time, the academic literature is summarized to conduct targeted research on the relationship between oil crisis and carbon emissions. On the empirical side, the NARDL model is used to explore the asymmetric effect of oil shock on carbon emission quota price. This study also contributed to the literature study. The model analyzes the short-and long-term interactions between the variables from a nonlinear perspective. And perform the related model construction[2].

3.3. Innovation

(1) The perspective of the topic selection is different from the linear perspective of the existing literature. Existing literature mainly symmetric long-term perspective, discusses the oil impact on the carbon emission quota price caused by the linear spillover effect, the perspective does not consider the impact of different policy environment, so in this paper, through the use of nonlinear regression distribution lag model, discusses the asymmetric effect of oil impact on carbon emission quota price.

(2) Innovation in research methods. Previously mostly using ARDL model, unable to measure the nonlinear change of variables, nor short-term economic policy uncertainty for the influence of the stock market, this paper adopts the NARDL method to test the short-term and long-term asymmetric relationship between oil impact and carbon emission licensing price, and further the pulse response analysis and the influence of different markets and different industries, making the whole empirical process more comprehensive[3].

4. Literature Review

(1) Scientific nature of the model establishment. This project abandons the ARDL model used by most scholars in the past, but uses NARDL model to carry out research. Therefore, it is necessary to constantly revise the model to effectively observe the nonlinear changes of variables, and make the whole empirical process more comprehensive and perfect. Dynamic multipliers are studied to demonstrate a dynamic asymmetric adjustment of carbon quota prices from initial equilibrium to new long-term steady states under negative or positive shocks of oil supply, demand or risk shocks. The results are shown in Figure Figure 33. The positive and negative curves respectively reflect the adjustment of the carbon quota price to shocks within a given forecast range.

(2) The sample data size and frequency are limited, preventing a more long-term empirical analysis. Since the impact of oil price volatility on carbon emission quota is divided into short-term impact and long-term impact, it is impossible to judge the impact of oil impact on carbon emission quota only through short-term analysis, thus weakening the empirical conclusion.

ISSN: 2688-9323

Acknowledgments

We would like to thank the Anhui Provincial College Student Innovation and Entrepreneurship Training Program (Project No.: S202310378038) for funding and the teachers of Anhui University of Finance and Economics for their support.

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