

Review of Research on Supply Chain Coordination of New Energy Vehicle under Dual Credit Policy at Home and Abroad

Pei Lu

Energy Economics Research Center Faculty of Business Administration, Henan Polytechnic University, Jiaozuo Henan province, 454000, China

Abstract

This article introduces the content and origin of the double-point policy. Aiming at the development status of the new energy vehicle supply chain under the double-point policy at home and abroad, the relevant literature is systematically combed to reveal the development of the new energy vehicle supply chain under the double-point policy at home and abroad. Research hotspots provide reference and basis for domestic and foreign scholars to carry out related research.

Keywords

New Energy Vehicle; Dual Credit Policy; Supply Chain; Review.

1. Dual Credit Policy Related Content

1.1. Reasons for the Implementation of the Dual Credit Policy

Car sales in China have been increasing in recent years. By the end of 2019, the number of cars in China had reached 260 million, with gasoline and diesel accounting for more than 70 percent of the country's gasoline and diesel consumption, on Energy and environmental issues. In order to deal with these problems, ease the pressure on energy and the environment, and promote the healthy development of the automobile industry, in recent years, the Ministry of Industry and Information Technology of the People's Republic of China and relevant departments have issued a number of supporting policies, including the measures for accounting the average fuel consumption of passenger vehicle enterprises and the promotion and application of new energy vehicles, a series of policies have played a positive role in promoting the healthy development of the automobile industry, and the sales of new energy vehicles are also increasing.

In order to optimize the structure of China's automobile industry, reduce energy consumption, and accelerate the pace of energy conservation and emission reduction. China and other countries in the world have chosen to increase the development of new energy vehicles. To this end, the Chinese government actively implements relevant policies to support and assist the new energy automobile industry. At the beginning of its development, the government gave financial subsidies and tax incentives to the promotion and demonstration of new energy vehicles. Although these measures have played an undeniable positive role in the development of new energy vehicles in China, they have also resulted in government subsidies. Excessive pressure, cheating by car companies, and lack of innovation have emerged. In order to guide new energy vehicle companies to actively innovate to improve battery life, the government decided to implement a subsidy retreat policy to stimulate the innovation ability of new energy vehicle companies, and also to make a choice for the survival of the fittest in the new energy vehicle industry. However, the industry has been supported by subsidies and various related policies since its emergence. The decline of subsidies and the strictness of the system will undoubtedly have a certain impact on the new energy automobile industry, which is still unstable. In order to alleviate a series of impacts and problems caused by the subsidy decline,

on September 27, 2017, the five ministries and commissions jointly issued the "Measures for the Parallel Management of Average Fuel Consumption of Passenger Cars and New Energy Vehicle Credits" (referred to as the "Dual credit" Policy), in order to replace the previous subsidy support policy, change the original government policy support orientation to market guidance as the orientation, and continue to promote the development of the new energy automobile industry. This policy will come into effect on April 1, 2018.

1.2. The Origin of the Dual Credit Policy

This policy mainly draws on the experience of automobile fuel economy regulations and zero-emission vehicle policies in Europe and the United States. It is a policy innovation that combines the inter-change of my country's automobile industry and government subsidies as market subsidies. The implementation of the "dual points" policy means that the new energy vehicle industry will shift from policy-driven to market-driven, with the help of supply-side reform advantages to guide auto companies to continuously increase the ratio of new energy vehicle production and sales, and establish a long-term market mechanism for the development of new energy vehicles. With the successive introduction of important policies such as subsidies decline and "dual credit", China's new energy vehicle development has entered a new era.

1.3. The Specific Content of the Dual Credit Policy

Every car manufacturer needs to produce new energy vehicles. Failure to produce or insufficient production will suspend production of high-fuel-guzzling vehicles as a penalty. Therefore, automakers can purchase new energy credits from other automakers if they stop production. Or the number of new energy vehicles produced in the previous year was large, and the new energy points had a surplus, which could be deducted within a certain period of time. Three major trends in the development of auto companies under the double-point policy:

1. Leading traditional car companies to transform into new energy vehicles;
2. Joint ventures and cooperation with new energy companies with mass production scale.
3. Purchase NEV positive points; fourth, improve its own energy-saving and emission-reduction technologies.

2. Summary of Related Research

2.1. Relevant Research on the Source of the Dual Credit Policy

At present, a large number of literatures have done relevant research on the implementation effects of foreign fuel economy regulations and zero-emission vehicle policies.

In addition, Jacobsen [1] et al. found through empirical tests that the standards of fuel economy regulations also have a direct impact on vehicle models.

On the basis of considering externalities such as environmental pollution and traffic congestion, Fischer et al. [2] believe that the impact of significantly improving fuel economy regulations on social welfare is difficult to determine.

By taking the United States as an example, Sen [3] and others showed that if the regulatory policies of fuel economy regulations and existing government incentives are effectively combined, it will help accelerate the expansion of the market share of electric vehicles, thereby improving the transportation sector. energy structure.

Through empirical analysis of the two high-emission industries of automobiles and energy, Bergek et al [4]. found that the zero-emission automobile policy plays a key role in the development and diffusion of innovation in the environmental field and can be used to support the development and deployment of new technologies. , Such as battery manufacturing.

Stokes et al [5] believe that relevant governments have overestimated the speed of commercial expansion of new technologies, leading to overly ambitious zero-emission vehicle policies

formulated in the early stages of technological development. In the case of high battery costs, the state needs to introduce Complementary incentives to stimulate the development of new energy vehicles.

The passenger car industry in North America was simulated through the use of dynamic technology models. Sykes [6] et al. concluded that in order to successfully achieve the greenhouse gas emission reduction targets in 50, each state needs to formulate an enhanced version of the Zero emission vehicle policy.

Through a case analysis of the biofuel industry in California, Chen [7] and others found that cellulosic biofuel technology plays an important role in ensuring that California completes 10% of greenhouse gas emission reduction tasks by 2020, but zero emissions The implementation of the automobile policy will hinder the development of this technology to a certain extent.

2.2. Research on the Dual Credit Policy

The double-point policy uses the market mechanism to encourage manufacturers to expand their new energy vehicle business, which is an important driving force for the transformation of traditional fuel vehicles to new energy. The existing literature has made certain on the impact of the implementation of the double-point policy on the government, enterprises, and society.

2.2.1. Research on the Evolution of the Double-Point Policy and the Impact of Its Implementation

Based on the co-word matrix analysis method and the decoupling model, Liu Hongtai et al [8] conducted a systematic evolutionary analysis of the new energy automobile industry policy, studied the inefficient mechanism of the new energy automobile industry subsidy policy from the perspective of policy obstruction, and double-integrated The coordinated implementation of policies is looking forward.

Zhang Qi et al. [9] found that the implementation of the dual-point policy can effectively promote the development of new energy vehicles and curb the development of fuel vehicles.

Li et al. [10] found that the implementation of the dual-point policy will increase the profits of manufacturers' new energy vehicles, but both the profits of fuel vehicles and the total profits will decrease.

Based on the quantitative analysis model of game theory, Li et al. [11]P" found that there is an alternative between the double-point policy and the current subsidy policy, which can alleviate the government's financial pressure and promote the development of new energy vehicles more effectively.

Zheng Jichuan et al. [12] constructed a three-stage game model in which new energy vehicle supplier manufacturers determine R&D investment level, supplier output competition, and manufacturer output competition under the dual-point policy with R&D subsidies, and explained the price of positive points. 1. The impact of market size on R&D investment and the mechanism and effect of R&D subsidies.

2.2.2. Relevant Research on the Supply Chain of New Energy Vehicles in Different Situations under the Background of Dual Credit

Zhou et al. [13] proposed the impact of the implementation of the dual-point system on green technology investment and pricing decisions under three scenarios: only traditional cars, both types of cars, and only green cars.

Cheng Yongwei and Mu Dong [14] studied the joint decision-making model of traditional fuel vehicles and new energy vehicles under three integration strategies in the market.

Lu Chao and Yan Junlin [15] studied the changing trend of the R&D value, total profit and social welfare function of oligarchic new energy car companies after the implementation of the double-point policy under the two situations of R&D competition and R&D cooperation.

Yu Xiaohui et al. [16] established a dual cooperative manufacturing model to measure the total revenue when the current output remains unchanged, and give a transaction price of points equivalent to the revenue of the current subsidy policy model, reducing the impact of "dual credit" on auto companies. Shock.

Tang Jinhuan, Yang Fang, Xu Jiawang[17] considered this supply-side policy drive, combined with the pulling effect of consumer behavior preference factors on the demand side, and studied both sides of supply and demand for an automobile manufacturer that produces both fuel-fueled vehicles and new energy vehicles. Driven by the optimal decision-making, environmental impact and consumer surplus of automobile manufacturers. The study found that in order to ensure a smooth transition of the automobile industry and not seriously harm the income of automobile manufacturers, it is necessary to adjust the points policy within a certain threshold.

3. Conclusions and Prospects

Through combing and researching the above-mentioned literature, we can find that scholars at home and abroad have done some research on the double-point policy and its related fields. Compared with the research on new energy vehicle subsidies, the research on the impact of the dual-point policy on the government, consumers, new energy vehicle manufacturers, and social welfare is relatively inadequate. At the same time, in this context, the supply chain There are relatively few quantitative studies on the optimal decisions of members. Especially when the credit trading market is gradually emerging, how to dynamically adjust the credit ratio and the price of credits according to the market demand situation of credits to achieve the purpose of promoting the quality of new energy vehicles and the market is a problem worthy of further study.

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