

Research on the Connection Between Government Subvention and the New-Energy Automobile Enterprises' Investment Behavior

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Abstract: This article discusses the connection between government subvention and the new-energy automobile enterprises' investment behavior. The article summarizes the analysis of the progression of the policies in the new-energy vehicle enterprises in chronological order and tells us how Chinese government subsidies benefit the new energy vehicle enterprises' investment behavior from the political aspect, economic aspect, social aspect, and technical aspect, which make up the PEST model. Based on the research, the Chinese government subsidies can contribute to the new energy vehicle enterprises investment behavior efficiently. In addition, this research helps people study the relationships between the government subvention and the new-energy vehicle companies' investment behavior, which supplies some reference for the related studies.

Keywords: government subsidies, policies, PEST model, carbon neutrality, environmental protection, emerging industries

1. Introduction

Government policies and subsidies contribute significantly to the development of new energy enterprises. As an example, because there is a shortage of energy and there has been a significant advancement in battery and charging technology, the development of a new generation of vehicles that are environmentally friendly and save energy, represented by electric vehicles, has become an unavoidable trend in the new energy industry [1]. Therefore, this article will talk about the research on the relationship between the government subvention and the new-energy vehicle companies investment behavior under the background of carbon neutrality. As a result, this article shows that government subsidies can contribute to energy savings and emission reduction in China under the background of carbon neutrality.

The following describes the article's framework: Part 2 discusses the literature review, which shows the articles and papers mentioned in the paper; The development process of the policy in the new energy vehicle enterprises is described in Part 3; Part 4 shows the methodology in order to prove the argument of the paper; Last but not least, Part 5 concludes the article.

2. Literature Review

Under the constraints of global resources and environmental problems, the energy situation is becoming worse, so the energy pattern needs to be changed urgently. As one of Chinese great emerging industries, the new-energy automobile industry is of great significance due to its multiple functions, such as ensuring the nation's energy security, reducing emissions and conserving energy, as well as transforming and modernizing the automotive industry. For instance, there are various investment directions for the new-energy automobile enterprises, such as investing in the current charging piles. These investment directions contain the advantages of a small volume and a lower investment cost, which are suitable for the new energy vehicle enterprises with lower incomes or at the initial stage [1], and the new energy vehicle enterprises also need to promote their core innovation abilities by investing in some new technology R&D or high-technology imports.

According to the international and national experience, the government is considered the investment financial policy maker and the necessary financier of subsidies [1]. Therefore, the functions of the government should not be ignored or underestimated by the new energy vehicle suppliers and customers, and the new energy vehicle companies can just take advantage of the support from the local or central governments, which could be technological support or financial support. Besides that, the government subsidies also have other positive influences on other aspects. For example, government subsidies increased the total amount of revenue generated by the new-energy vehicles. In 2009, the annual sales of the new energy vehicles were less than 500. At the end of the year 2020, the sales volume of the new-energy vehicles in China will have reached 4.92 million, ranking first in the world [2]. According to these findings, an increasing number of consumers are opting for automobiles that run on alternative fuels, which has the potential to have a significant impact on initiatives aimed at reducing China's environmental impact and maximizing the country's energy efficiency. Thus, the industry of new-energy automobiles is a kind of emerging field, and the subsidies provided by the government can be helpful for the development of the new-energy automobile enterprises, the transformation of the national energy structure, and ultimately the achievement of the goals of emission reduction and energy conservation in China.

3. Analysis of the Development of the Policies in the New Energy Vehicle Enterprises

3.1. The First Phase: Expanding the Domestic Market of the New-Energy Automobile Enterprises in China

In the primary phase, the government subsidies tended to contribute to the larger domestic market of the new-energy automobile enterprises in China. A series of events and policies connected to the government subsidy policies of new-energy automobile industry can demonstrate the subvention direction that the article has mentioned in the last paragraph. For instance, in the Notice on Carrying out the Pilot Work of the Demonstration and Spread of Energy-Saving and New-Energy Automobiles [3], the notice shows that for expanding automobile consumption, speeding up the adjustment of automobile industrial structure, and fostering the manufacture of energy-efficient and alternative-energy automobiles, the Ministry of Finance and the Ministry of Science and Technology decided to perform the pilot project of the demonstration and the spread of energy-efficient and new-energy automobiles in 13 cities, and these two departments wanted to use the fiscal policies to encourage the public transport, car leasing, official business, and the public service industries including sanitation and postal services to take the initiative to promote the usage of energy-efficient and alternative-energy automobiles, and the subsidies will be given to the units that promote the use of energy-efficient and new-energy automobiles [3]. This notice proves that the government supplied the subsidies for expanding the domestic market of the new energy vehicle by encouraging more public

purchase behaviors in China and supplying great after-sale services. All of these details show that the government has outlined the future progress direction of the new-energy automobiles during the primary phase, and this direction can be seen in the second phase of the government's subsidy policies.

3.2. The Second Phase: Infrastructure Construction and Technological Innovation

Based on the first phase, infrastructure construction and technological innovation have become the key points on account of the lower costs of manufacturing the new-energy automobiles. In other words, the infrastructure construction and the technological innovation can reduce the costs of producing the new energy vehicles and create more opportunities for obtaining profits for the new energy vehicle enterprises by supplying more services related to these vehicles.

The National Development and Reform Commission (NDRC) said that it is imperative that the subsidy policies make further improvements to the pricing system for electricity in order to encourage more responsible use of energy and protection of the environment [4], and these subsidies should also encourage the new energy vehicle enterprises to provide energy storage services and obtain revenues through the difference between the peak electricity prices and the valley electricity prices. Besides the policies of the electricity prices, the central government decided to award the best infrastructure construction of the new-energy vehicle industry in the Notice on the Issues Related to Electric Vehicle Electricity Price Policy, 2014. In 2016, the Notice on the Incentive Policies for Charging Infrastructure of the New Energy Vehicles during the 13th Five-Year Plan and Strengthening the Promotion and Application of New Energy Vehicles described that the cities with the larger number of using new-energy automobiles and the better charging facilities will be rewarded [5]. The reason for these kinds of subsidy policies is that the lower prices of the new-energy automobiles can reduce the profits of the new-energy automobile enterprises, so the Chinese government chose to support the new energy vehicle enterprises by rewarding the infrastructure construction and the technological innovation.

3.3. The Third Phase: Generalizing the Subsidy Policies

During the last phase, the National Development and Reform Commission described how the Chinese government tended to generalize the subsidy policies with some specific conditions. For instance, the Notice on the Financial Support Policies for the Promotion and Application of the New-Energy Automobiles from 2016 to 2020 said that “the four ministries and commissions have carried out the application and promotion of the new-energy automobiles throughout the country, and the central government has provided subvention for the purchase of the new-energy automobiles and implemented the overall preference structure.” There are several factors included in the generalized system preferences: the subvention targets, the subsidized products, and the subsidy standard. 1) The subsidy objects are the consumers of the new energy vehicles; 2) The subsidized products are the pure electric vehicles, plug-in hybrid vehicles, and the fuel cell vehicles; 3) The subvention standard is primarily predicated on the effect of the energy savings and the reduction in emission levels, and takes into account the production costs, scale effect, technological progress and other factors for gradually declining in the subsidies in the future. These standards can be helpful for the independent progression of the new-energy automobile enterprises, so there is no need to worry about the enterprises' deception for the subsidies [6].

All in all, the Chinese government wants the new energy vehicle market to be sufficiently expanded with the help of the purchase subsidies and any other subsidies. After the domestic new-energy automobile market has been developed, the innovation and the new technology have been required by the government and been demanded by the new-energy automobile enterprises for more profits and the sustainable development in the future.

4. Methodology: The Analysis of the PEST Model

This section uses the PEST analysis to analyze the Chinese government's subsidy policies and their influence on the new-energy automobile industry. PEST analysis is a kind of macro-environment analysis: P means politics, E means economy, S means society, and T means technology. These four factors are usually used to analyze the situation faced by enterprises.

4.1. Politics

For the political factors, the Chinese government has issued a series of subsidy policies to support the sustainable development for the new-energy automobile industry. The specific subsidy policies have been discussed a lot in the last section. Moreover, in a peaceful political environment, all of the subsidy policies can be efficiently implemented, and the long-term plans for expanding the new-energy automobile market and attracting consumers of the new-energy automobiles can also be completed under such a peaceful political situation.

4.2. Economy

The foreign traditional industries started earlier than the traditional industries in China and the foreign traditional industries have developed for several centuries, so the foreign traditional industries are in a dominant position. However, the development of new industries lately can produce new possibilities for increasing Chinese economics. Recently, the economy in China has greatly developed with the progression of the new-energy automobile industry in China. For instance, the GDP in China has reached 101.6 trillion yuan, which has increased by 2.51 trillion yuan compared with the GDP in 2019. As a result of the high speed of development in China, the disposable personal income of Chinese residents has reached 32,200 yuan in 2020 and has increased by 1,500 yuan compared with the disposable personal income of Chinese residents in 2019 [7]. This data shows that the abilities of consuming the new-energy automobiles has been improved as the dramatic development of the economy in China.

4.3. Society

Since the 21st century, the popularity of driving automobiles in our society has become higher and higher. For instance, the amount of motor vehicle drivers in China has reached 476 million by September 2021 [7], which means that more and more people in China would like to buy cars, and there has been a large market for the new-energy automobiles. Moreover, since the Chinese government published the reform and open policies, most Chinese people would like to accept the new objects and concepts, which also helped build a favorable social environment for the sales and development of the new energy vehicles. Moreover, the customers of the new-energy automobiles are also in a supportive society. For example, the subsidy policies can lower the prices for purchasing the new-energy automobiles for the customers, which means it is much cheaper for the people to buy the new energy motors. As such, the amount of potential customers will rise with the help of the subsidy policies in the society of supporting new energy vehicle industries.

4.4. Technology

The number of patents for new-energy automobiles is growing. In 2020, Chinese new-energy automobile industry will have applied for 11208 patents, which is more than 1816 compared with the number in 2019 [7]. In other words, the continuous emergence of the new technologies with the help of the government subsidies has significantly promoted the high-quality development of the new-energy automobile industry in China.



Figure 1: The structure of PEST model for the analysis of the connection between the government subvention and the new-energy automobile enterprises' investment behavior.

5. Conclusion

This article discusses the connection between the government subvention and the new-energy automobile enterprises' investment behavior in four different parts. The first half of this article demonstrates, against the backdrop of carbon neutrality, that the government subvention in China can contribute to the saving of energy and the reduction of emissions. The second part describes the background of the article by way of a literature review, which shows that the government subsidies can be helpful for the progression of new-energy automobile enterprises, the transformation of the national energy structure, and achieving the goals of environmental protection in China. Part 3 mentions the analysis of the progression of the policies in the new-energy automobile enterprises in three phases. Part 4 says that the government subsidies can be helpful for the new-energy automobile enterprises' investment behavior based on the four aspects of the PEST models. As a result, all of the factors introduced in the article can benefit the new energy vehicle enterprises' investment behavior with the help of government subsidy policies. In addition, This article makes use of the PEST research method in order to conduct an efficient investigation into the relationship between the government subvention and the investment behavior of the new-energy vehicle firms based on the studies that are already available.

References

- [1] Zhang, Y., Pu, Y., & Shi, L. (2014). *The analysis on electric vehicle charging infrastructure and government strategy*. *China Soft Science Magazine*, 6.
- [2] *The Influence of the National Subsidy Policy on the Development of the New Energy Vehicles*. (2021). <https://www.fx361.com/page/2021/0910/9642826.shtml> (invalid website)
- [3] The ministry of finance, & The ministry of science and technology. (2009, January 23). *The Notice on Carrying out the Pilot Work of the Demonstration and Spread of Energy-Saving and New Energy Vehicles*. Ministry of Finance of the People's Republic of China. http://www.mof.gov.cn/gkml/caizhengwengao/2009niancaizhengbuwengao/caizhengwengao2009dierqi/200904/t20090413_132178.htm.
- [4] The national development and reform commission. (2014, July 22). *The Notice on the Issues Related to Electric Vehicle Electricity Price Policy*. *The National Development and Reform Commission of the People's Republic of China*. https://baike.baidu.com/reference/15145561/24a9TLlib-1rK5CZFYUS_J50TvLcfpgBDCVqWD9MHcAixcR_ipA6kkGmMV7WzV82gt-eUu2Qflc0_R0gl3KKZZULja6E_xcfhvc9MGOCR5Ln5j2PdQ
- [5] The ministry of finance, The ministry of science and technology, The ministry of industry and information technology, The national development and reform commission, & The national energy administration. (2016, January 20). *The Notice on the Incentive Policies for Charging Infrastructure of the New Energy Vehicles during the 13th Five-Year Plan and Strengthening the Promotion and Application of New Energy Vehicles*. Shanghai New Energy Center for Technology Transfer and Industry Promotion. http://www.most.gov.cn/tztg/201601/t20160120_123772.htm
- [6] The ministry of finance, The ministry of science and technology, The ministry of industry and information technology, & The national development and reform commission. (2015, April 22). *The Notice on the Financial Support Policies for the Promotion and Application of the New Energy Vehicles from 2016 to 2020*. *The Chinese Government (GOV.CN)*. http://www.gov.cn/xinwen/2015-04/29/content_2855040.htm

- [7] Baiteng network, Zhiyan consultation and data collection website, National bureau of statistics of the people's republic of china, The ministry of public security, & Bp. (2021). *The Analysis of China's New Energy Vehicle Industry Development Environment (PEST) in 2021. Zhiyan Consultation and Data Collection Website.* https://mbd.baidu.com/newspage/data/landingsuper?id=1716208647623323316&wfr=spider&for=pc&third=baijiahao&baijiahao_id=1716208647623323316&c_source=kunlun&c_score=0.999000&p_tk=7760k2rjlSxipXE%2FiJUcJQqBpTmWPUwWzJf3u0qz2%2F6JzMYOwfTIutnmMoYXsiNiCJVzKjrUjK