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Research on the Impact of Fiscal Subsidies on BYD's Sale of New Energy Vehicles - Take Shanghai as An Example

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Abstract

Background and Aim: The new energy vehicle industry is an important way for China to realize economic transformation and industrial upgrading, and is a strategic measure to promote China's passenger car industry from big to strong. At present, the problem of China's automobile industry being large but not strong is more prominent. How to promote the development of China's new energy automobile industry is of great significance to the curve overtaking. This paper on Shanghai BYD new energy vehicle sales as the research object, analyzes the influence factors of BYD new energy vehicle sales, at the same time, the analysis analyzes the fiscal policy of Shanghai BYD new can use car sales, under this research purpose, this paper needs to complete the following research tasks.

Materials and Methods: First, analyze the relevant data and problems of BYD's new energy vehicles, and collect relevant data to lay the data foundation for empirical analysis. Second, for the experimental group in Shanghai, Beijing as the control group, using the double difference DID analysis model to study the influence of fiscal subsidies on BYD new energy vehicle sales, chose Beijing as the control group, on the one hand, are Beijing and Shanghai in GDP, population base, per capita income level, at the same time, to the Shanghai subsidies for new energy vehicles for pilot areas, Beijing has not yet implemented the corresponding fiscal subsidy policy, thus makes Beijing suitable as a control group of this research. Thirdly, according to the conclusion of the empirical research, put forward corresponding optimization suggestions from the perspective of the government. A quantitative approach was adopted to test the hypothesis. The research showed that the financial subsidy policy has a positive impact on the sales of BYD new energy vehicles.

Results: New energy vehicles are still in the initial stage of promotion. In the process of promotion of new energy vehicles, the government has given corresponding preferential policies. The summarized as fiscal subsidies policy TuiPo influences new energy vehicle sales, infrastructure construction, and subsidy form. The subsidies of BYD new energy vehicles sales of the double difference DID analysis.

Conclusion: The financial subsidy policy has a positive impact on the sales of BYD new energy vehicles, that is, the financial subsidy policy plays a role in promoting the sales of BYD new energy vehicles. From the above research conclusions, financial subsidies have played a positive role in promoting the sales of BYD's new energy vehicles.

Keywords: Financial Subsidy; New Energy Vehicles; BYD; Sales

Introduction

The new energy vehicle industry is an important way for China to realize economic transformation and industrial upgrading and is a strategic measure to promote China's passenger car industry from big to strong. At present, the problem of China's automobile industry being large but not strong is more prominent. How to promote the development of China's new energy automobile industry is of great significance to the curve overtaking. Whether in the present or in the long run, the study of financial subsidies to the incentive effect of new energy vehicle enterprises has an important significance. On the one hand, the support of subsidy policies can help enterprises to introduce more technical forces in a short period of time, and rapidly increase the output of new energy vehicles, so as to expand their production scale. On the other hand, the subsidy policy gives buyers a certain amount of subsidies that can not only reduce the cost of buyers in the face of new energy vehicles, so as to increase their sales but also help the masses of people to realize the importance of energy saving and environmental protection. In the long run, the development of new energy vehicles can help China to improve the manufacturing level of new energy vehicles, make the industrial structure and core technology to a higher level, change the economic development mode and improve the market share, and stand out in the future economic and technological forces.

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Objectives

This paper on Shanghai BYD new energy vehicle sales as the research object, analyzes the influence factors of BYD new energy vehicle sales, at the same time, the analysis analyzes the fiscal policy of Shanghai BYD new can use car sales, under this research purpose, this paper needs to complete the following research tasks:

First, analyze the relevant data and problems of BYD new energy vehicles, and collect relevant data to lay the data foundation for empirical analysis;

Second, for the experimental group in Shanghai, Beijing as the control group, using the double difference DID analysis model study the influence of fiscal subsidies on BYD new energy vehicle sales, chose Beijing as the control group, on the one hand, is Beijing and Shanghai in GDP, population base, per capita income level, at the same time, to the Shanghai subsidies for new energy vehicles for pilot areas, Beijing has not yet implemented the corresponding fiscal subsidy policy, thus makes Beijing suitable as a control group of this research;

Thirdly, according to the conclusion of the empirical research, put forward corresponding optimization suggestions from the perspective of the government.

Literature Review

Chinese scholars Jiang (2020) through the use of empirical analysis methods of fiscal and taxation preferential policies on BYD company's new energy automobile enterprise studied, mainly the consumption tax, business tax, education additional tax, VAT tax, and other tax policy perspective of BYD new energy automobile enterprise financial indicators regression analysis, through empirical analysis he got the tax preferential policies for BYD company new energy automobile financial index has a positive effect. Liu (2021), using the dual difference DID model analysis and regression analysis of fiscal subsidies and tax incentives studied the influence of the new energy automobile industry, he studied the fiscal subsidies and tax incentives for explanatory variables, selected the new energy industry car sales for the explanatory variables, finally, he got the fiscal subsidies, tax incentives for new energy industry sales has a positive impact relationship. Zhang (2022) using dual differential DID model analysis of vehicle purchase tax preferential policy studied the influence of new energy vehicle sales, he was selected in the empirical analysis of the explanatory variables for new energy vehicle sales, explanatory variables for the vehicle purchase tax breaks, he used dual differential DID model analysis that vehicle purchase tax preferential policy for the sales of new energy vehicles. Wang (2022) of "carbon peak and carbon neutral" policy studied the influence of the auto industry, in theory, the country issued "carbon peak and carbon neutral" policy is based on environmental protection environment, in order to solve the ecological environment pressure to achieve ecological balance, the ultimate goal of the policy is to guide more consumers to buy new energy vehicles, so as to reduce the influence of traditional energy vehicles on the ecological environment. Wang used a combination of qualitative and quantitative analysis to explore the impact of carbon peak and neutral policy on the automobile industry. Through the analysis of contemporary and traditional vehicles, and the data visualization and trend analysis through Python and plot functions, he showed the impact of the "carbon peak and neutral" policy on the data of pure new energy and traditional vehicles. The samples were then divided into treatment and control groups. A double-difference research method was used to compare the data before and after the implementation of the net impact of the policy. Finally, he concluded through empirical analysis that the policy of "carbon peak and carbon neutral" has a positive impact on the development of the new energy vehicle industry. Deborah (2020) studied the influence of the fiscal and taxation policies on new energy automobile enterprises, he said the fiscal and taxation policies of new energy vehicles of new energy automobile sales and the development of the industry are very important, especially the new energy vehicles that represent the science and technology research and development direction also represents the industry development direction, more need the policy support and cultivation. He took Tesla new energy vehicles in the United States as an example and conducted an empirical study of the US fiscal policies on the sales of Tesla new energy vehicles in the United States, and concluded that the fiscal policies in the United States can promote the sales of Tesla new energy vehicles in the United States. He (2022) has studied the market demand and policy guidance of

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new energy vehicles, He said that with the increasing demand for car ownership in the consumer market, The pressure to produce fossil fuels is also increasing, New energy vehicles as energy and environmental friendly products, Will soon become a general trend of the global auto industry development, He analyzed the factors affecting the purchase intention of new energy vehicles and consumption preferences through the binomial Logit model, After analyzing consumer preferences and purchase intentions, Then, to understand the relationship between market demand and policy orientation through empirical analysis, Finally, he concluded that the policy guidance can effectively guide consumers' consumption choices and consumption behaviors in the new energy vehicle market. That is, the policy guidance has a certain stimulating effect on the demand of the new energy vehicle market. Peter And Roland (2010) found through empirical research that the government's tax rebates for new energy vehicles and other preferential policies for new energy vehicles can effectively encourage automobile enterprises to produce and sell new energy vehicles, and to a certain extent, can effectively promote the increase of sales of new energy vehicles and the increase of market share. McKinsey (2010) adopted the method of quantitative investigation and qualitative tests to study the relationship between the government's financial subsidies and new energy vehicles. After data collection and quantitative analysis, McKinsey (2010) reached the conclusion that government financial subsidies can promote the development of new energy vehicles and drive the increase in sales of new energy vehicles. Bernstein (2011) more than 20 cities issued a fiscal subsidy policy for new energy vehicles and traditional fuel car sales quantity collected, through the empirical analysis they draw traditional fuel car sales prices than new energy vehicles sales prices, and at the same time the traditional fuel cars without the government fiscal subsidy policy, more consumers are willing to buy new energy vehicles. According to this, the financial subsidy policy of new energy vehicles can effectively guide consumers' choices, so as to promote the sales of new energy vehicles.

In general, the impact of financial subsidies and other policies studied by predecessors and scholars on the sales volume of new energy vehicles generally shows a positive correlation.

Research Hypothesis and Methods

According to the domestic and foreign literature review part of the relevant information, this paper reviews the relevant information, the relevant research scholars at home and abroad on the influence of the research project for fiscal subsidies for new energy vehicle sales has a positive effect. The fiscal subsidy policy has promoted BYD's sales of new energy vehicles. At the same time, according to the market failure theory, the government needs to intervene in the market economy through policy means by simply relying on the market price system, so as to alleviate the effectiveness of resource allocation, so as to promote sustainable development of the market economy. In the market failure theory and the limitations of ecological environment, the current global actively promotes the development of new energy automobile industry is mainly based on the ecological environment of the pressure, the market limitations on the ecological environment said ecological environment problems to the market to solve but need to teach national supervision, management, and protection. At the same time, according to the mechanism analysis theory of financial subsidies affecting consumers 'choice, financial subsidies can affect the choice of consumers, and the income effect theory shows that the government's financial subsidies can stimulate consumers' consumption ability and increase the sales volume of goods. Replacing effect theory said that government subsidies can adjust the consumer consumption structure, so as to realize the macroeconomic regulation and control of industrial structure and realize the government's development strategy and social goals, according to the above literature review theoretical basis and market failure theory and financial subsidies influence the mechanism of consumer choice analysis theory, this paper puts forward the following assumptions:

Suppose H 1: The fiscal subsidy policy has a positive impact on the sales volume of BYD's new energy vehicles.

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Results and Discussion

Descriptive statistical results

The main variable of this paper is the sales volume of BYD new energy vehicles. Now, the maximum, minimum, median, and mean data of these main variables are made in descriptive statistics. The specific statistical results are shown in Table 4.2 below.

Table 1 Descriptive statistics of the raw data samples

Variable name	Least value	Crest value	Median	Mean
SV it (ten thousand units)	0. 179	17.219	0.834	1.830

In order to avoid the difference between the data, this paper normalized the original data, and the dimensional expression is transformed into a dimensionless expression and becomes pure quantity. The normalization processing of the data changes the original data into a decimal between (0,1), maps the data to the range of 0~ 1, and makes the dimensional expression into a dimensionless expression, so as to make the data processing more convenient. Accordingly, the results of normal the raw data are shown in Table 4.3 below.

Table 4.3 Descriptive statistics for sample data

Variable name	Least value	Crest value	Mean
SV it (ten thousand units)	0.0000	1.0000	0.0969

Parallel trend test

An important premise of the double difference model is that the experimental group and the control group should have similar development trends before external impact, that is, the experimental group and the control group need to meet the parallel trend before the empirical analysis, this paper refers to the study of the data of Shanghai and Beijing before the policy implementation (2009-2017), regression results are shown in Table 4.4.

Table 4.4 Results of regression of event studies

Interactive items	Coefficient	P-price
Before -3.0	0	0.914
Before -2.0	0.001	0.892
Bef ore - 1.0	0.004	0.340
After - 1.0	0. 112	0.000***
After -2.0	0.261	0.000***
After -3.0	0.816	0.000***

The contents of Table 4.4 above are the result of regression using the year variable and the interaction term of whether to handle the group variables. The coefficient of the interaction term reflects the difference between the treatment and control groups in specific years (Before-1.0, Before-2.0 Before-3.0 mean the three years before the event, and After-1.0, After-2.0, and After-3.0 mean the three years after the event). It is generally hoped that the coefficient of (Before) before the event is not significant, indicating that the parallel trend assumption is met, and then (After) is significant, reflecting the effect of the policy. According to the results shown in Table 4.3 above, the significance P-value of Before-1.0 is 0.340, the significance P-value of Before-2.0 is 0.892 and Before-3.0, and the P-value of significance is 0.914, both greater than 0. 1 or 0.05. Therefore, the coefficients of Before-1.0, Before-2.0, and Before-3.0 are not significant, indicating that the model meets the parallel trend hypothesis.

Meanwhile, the t-test (Before) was also performed for this model, and the test results of the t-test (Before) are shown in Table 4.5 below.

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Table 4.5 t-test (Before) table

Item	Control (Control group) n =9	Treated (Experimental group) n =9	Diff	t	P-value
Y (SV)	0.018	0.024	0.006	0.598	0.558

Note: * p <0.05 * * p <0.01

The above table shows the parallel trend test by t-test, that is, the t-test is conducted between the treated variables and the explained variables. If there is no significance, it means that the "parallel trend" test is met; otherwise, it means that the "parallel trend" test is not satisfied. According to the results shown by the t-test performed in Table 4.5 above, the significance P-value of 0.558 is greater than 0.05, indicating that the model meets the parallel trend test. Thus two-fold differential DID analysis of this model.

Difference-in-Differences DID Analysis

In this paper, the relevant double difference DID model was constructed in the above analysis. In this paper, the value before the event is 0 (before the policy implementation in 2018), the value after the event is 1 (after the policy implementation in 2018), the Treated of the experimental group is 1, and the Treated of the control group is 0. The results of the double difference DID analysis of the model are shown in Table 4.6 below.

Table 4.6 Results of the dual difference DID model

Item		Effect value	P price
Before the incident	Control group	0.960	
(Before)	Experimental group	0.438	
	Diff (T -C)	0.349	0. 123
After the incident	Control group	-0.041	
(After)	Experimental group	0.595	
	Diff (T -C)	0.636	0.008**
Diff-in-Diff	0.287	0.019*	

Note: * p <0.05 * * p <0.01

According to the information shown in Table 4.6 above, the significance of the dual difference value Diff-in-Diff is 0.019, less than 0.05, which means that the policy of this study plays a role. According to the results of the dual difference DID model in the table above, the coefficient of Diff-in-Diff is 0.287. According to the model (equation 1) constructed in this paper, the intervention of this policy is effective and shows a positive relationship, that is, the financial subsidy policy of new energy vehicles plays a role in promoting the sales volume of BYD's new energy vehicles. It follows that the hypothesis presented in this paper

H1: The financial subsidy policy has a positive impact on the sales of BYD new energy vehicles. Accordingly, this paper in the third chapter of the analysis of BYD new energy vehicles in the development of fiscal subsidy policy TuiPo to a certain extent, reduces the number of new energy vehicles sales, infrastructure construction, and the insufficiency of subsidies form, under the guidance

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of the empirical research conclusion, this paper to BYD new energy vehicles in the development problems in the fifth chapter the corresponding optimization Suggestions are put forward.

Conclusion and Recommendations

With the increasing pressure of environmental protection, environmental protection policies are also constantly strengthened and implemented. Traditional fuel vehicles are one of the important elements causing environmental protection pressure in China. In order to solve the social environmental problems and create a livable living environment for the people, the promotion of new energy vehicles is one of the trends of the development of The Times. At present, new energy vehicles are still in the initial stage of promotion. In the process of promotion of new energy vehicles, the government has given corresponding preferential policies, such as preferential tax policies, financial subsidy policies, right-of-way priority policies, license policies of traditional fuel vehicles, and so on. At the same time, China's new energy vehicle industry in the development process also has corresponding problems, first, there are certain problems with financial subsidies, and second, there are certain problems in infrastructure construction. In the third chapter, the problems of BYD new energy vehicles are analyzed, respectively summarized as fiscal subsidies policy TuiPo influence new energy vehicle sales, infrastructure construction, subsidy form, in the fourth chapter of the article of the subsidies of BYD new energy vehicles sales of the double difference DID analysis, the analysis results are as follows:

After the double difference DID analysis of the impact of the financial subsidy policy on the sales of BYD new energy vehicles, this paper concludes that the financial subsidy policy has a positive impact on the sales of BYD new energy vehicles, that is, the financial subsidy policy plays a role in promoting the sales of BYD new energy vehicles. From the above research conclusions, financial subsidies have played a positive role in promoting the sales of BYD's new energy vehicles.

References

Bernstein. (2011). Research on the development of financial subsidies to the new energy automobile industry. *Journal of Environmental Economics and Management.* (5), 60-65.

Deborah L. (2018). Research on the impact of fiscal and tax policies on new energy.

He, W.(2020). Research on market demand and policy orientation of new energy vehicles. *Transportation Research,* 20(34), 208-218.

Jiang, Yangjieni. (2020). Research on the Impact of Financial and Tax Preferential Policies on New Energy Automobile Enterprises. *Jinan University*, pp34-43.

Liu, Pengchi. (2021). Research on the Impact of Financial Subsidies and Tax Incentives on the Innovation Output of the New Energy Vehicle Industry. *Jiangxi University of Finance and Economics*, pp78-83.

McKinsey &Company. (2010). Research on fiscal and tax policies to promote the development of new energy vehicles. *McKinsey&Company*. 2(21),52-56.

Peter and Roland. (2010). Research on the impact of financial subsidies on the development of the new energy vehicle industry. *Transport Policy.* 2 (10), 32-36.

Wang, Juyi. (2022). *The Impact of "Carbon Peak and Carbon Neutrality" Policy on the Automobile Industry*. Qingdao, China.

Zhang, Xi. (2022). Research on the impact of financial subsidies for new energy vehicles on the sales of new energy vehicles. *Jiangxi University of Finance and Economics*.

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