A Research on the Impact of China's Subsidy Reduction Policy on Tesla's Market Performance

Ruiheng Song *

School of Accounting, Southwestern University of Finance and Economics, Chengdu, 611130, China

* Corresponding Author Email: 42214005@smail.swufe.edu.cn

Abstract. This study examines how Tesla's success in the Chinese market has been affected by China's new energy vehicle subsidy reduction policy. China's subsidy policy, which has been implemented since 2008, has promoted the production and consumption of new energy vehicles. However, as the industry matures, the government has begun to reduce financial support. The subsidy reduction aims to encourage companies to improve their competitiveness through technological innovation and cost control, rather than relying on policy support. This paper first summarizes the total effect on the new energy vehicle industry of the removal of subsidies through a literature review and then uses Tesla as the research object to evaluate the impact of policy changes on its market performance using time series analysis and multivariate regression models. The study finds that the subsidy reduction has led to a slowdown in Tesla's sales growth and a weakening of the price advantage of high-end models; At the same time, local brands such as BYD have further expanded their market share with their price and localized supply chain advantages. This study provides a reference for new energy vehicle companies to respond to policies and also provides insights for the government to formulate industrial policies that balance market competition and policy support. In addition, by demonstrating the extensive effects of subsidy policies on the structure of market competition, this paper provides theoretical and practical support for promoting the sustainable development of the new energy vehicle industry.

Keywords: China's Subsidy Reduction Policy, Tesla Group, New Energy Vehicles.

1. Introduction

Since 2008, the Chinese government has greatly promoted the development of the new energy vehicle market by implementing a series of subsidy policies. These policies are mainly centered on financial subsidies, tax reductions, etc. intending to encourage the production and consumption of new energy vehicles in order to lower carbon emissions and advance the developments of the environmental protection sector. Especially in the early stage when new energy technology was not yet mature and the cost was high, government subsidies played a vital role in helping companies achieve large-scale production and reduce production costs.

However, as the new energy vehicle industry gradually matured, through a program known as "subsidy reduction," the Chinese government progressively decreased direct subsidies for new energy vehicles. The purpose of subsidy reduction is to promote market competition so that new energy vehicle companies no longer rely on financial support, but instead maintain their competitiveness through technological innovation, improving product quality and reducing costs. This policy change has brought new challenges and opportunities to major companies in the market, especially foreign companies such as Tesla.

As the world's leading electric vehicle manufacturer, Tesla has always performed well in the Chinese market. However, its sales, cost structure, and market strategy in China have all been significantly impacted by the withdrawal of subsidies. Thus, it is both academically and practically significant for studying how the policy of subsidy reduction has affected Tesla's market performance. On the one hand, this helps to understand the impact of policy changes on corporate behavior and market outcomes, and on the other hand, it provides a reference for the government when formulating industrial policies. In addition, this research can also provide useful inspiration for the future development strategies of Tesla and other new energy vehicle companies.

China has become the world's largest new energy vehicle market and one of Tesla's most important overseas markets. Since Tesla established its first overseas Gigafactory in Shanghai in 2019, Tesla has achieved significant growth in the Chinese market. Tesla's Model 3 and Model Y models are very popular in the Chinese market with their advanced technology, good performance, and relatively competitive prices.

Tesla's China market strategy mainly relies on localized production, shortening the supply chain, improving production efficiency, and cooperating with local suppliers to reduce costs. The Chinese market not only brings huge sales to Tesla but also provides it with an important production base. The commissioning of the Shanghai factory allows Tesla to take advantage of China's manufacturing advantages to produce high-quality electric vehicles at a lower cost and export them to other markets.

However, Tesla faces fierce competition in the Chinese market, especially from local brands such as BYD, NIO, and Xpeng. These companies occupy a considerable share of the market and have gained the favor of a large number of consumers through innovation and localization strategies. With the withdrawal of subsidy policies, this competitive environment has become more complex, and to preserve its edge over the competition, Tesla must continuously modify its market strategy. Therefore, evaluating the effect of subsidy reduction on Tesla's market performance demands a thorough understanding of the company's position in the Chinese market as well as its responses to modifications to regulations.

From a theoretical perspective, this study provides theoretical support for understanding the impact of China's new energy vehicle subsidy reduction policy on the market performance of foreign-funded enterprises, especially Tesla. This has important theoretical value for evaluating the effectiveness of government subsidy policies and their impact on market competition. By deeply analyzing Tesla's performance in the Chinese market after the subsidy reduction, this study can reveal how policy changes affect the company's market share, pricing strategy and competitive landscape with local companies, thereby providing a theoretical basis for the government to formulate and adjust new energy vehicle industry policies.

In addition, studying Tesla's response strategy after the subsidy reduction can also provide theoretical references for other participants in China's new energy vehicle market, especially how to maintain market competitiveness through technological innovation, cost control and market strategy adjustment in the face of changes in the policy environment. This has major theoretical implications for encouraging the long-term development of the whole new energy vehicle sector.

From a practical perspective, this study has important guiding value for the strategic formulation of new energy vehicle companies in the context of policy changes. By analyzing Tesla's market strategy adjustments and their effects under the background of subsidy reduction, it can provide other companies with practical experience and strategic suggestions for coping with similar policy changes. This has direct reference value for those companies facing the reduction or even cancellation of government subsidies.

At the same time, this study also provides policymakers with practical insights on how to balance free market competition and government support. By understanding the far-reaching impact of subsidy reduction on the market, the government can better formulate policies to promote the healthy development of the market, it can not only encourage the widespread use of new energy vehicles but also help businesses avoid becoming overly dependent on subsidies while promoting the industry's consistent long-term growth. Finally, with the increasing global attention to environmental protection and sustainable development, the popularization of new energy vehicles has important social value. By exploring the impact of subsidy reduction policies on the market performance of enterprises, this study will help promote the acceptance and popularity of new energy vehicles among consumers, thereby contributing to reducing carbon emissions and improving environmental quality.

2. Literature Review

In the 2022 "China New Energy Vehicle Big Data Research Report", it can be concluded that China has become the world's largest new energy vehicle market, reaching the scale of nearly 10 million vehicles. On November 4, 2022, the number of vehicles connected to the new energy vehicle testing and management platform exceeded 11 million. In recent years, the country's policy support for new energy vehicles has gradually tended from less to nothing, and in 2023, the subsidy for domestically produced new energy vehicles was officially ended. Although the current national development orientation for the future automobile industry is energy conservation and emission reduction, the policy support for more than ten years has not only promoted the rapid development of the new energy vehicle industry but also brought corresponding restrictions to the new energy vehicle industry. First, some companies rely heavily on subsidies. The implementation of the subsidy reduction policy will make it difficult for companies that lack technical reserves and market competitiveness to operate and exit the market. For example, JAC Motors, Zhidou Automobile, and BAIC New Energy EV series have all been affected by the decline and exited the market. Secondly, the subsidy reduction may also affect the short-term fluctuations of the market in the short term, and consumers' wait-and-see sentiment will increase, leading to a decline in sales and affecting the stability of upstream and downstream industries in the industrial chain. At the same time, as subsidies gradually decrease, companies need to increase their R&D investment to expand their market competitiveness. However, if they cannot achieve a breakthrough in the short term, it will lead to low competitiveness of competing products, a broken capital chain, and other problems. HiPhi is a typical example. Due to its insufficient technical competitiveness and low market recognition, it encountered capital chain problems and ultimately could not maintain normal operations. Therefore, in order for new energy vehicle companies to achieve independent development, no longer rely on government financial support, and independently improve their own market competitiveness, the Chinese government began to introduce a six-year subsidy reduction policy in 2017.

The implementation of subsidy reduction can reduce the government's financial pressure and help the government make more reasonable financial allocations. In addition, in the early stages of the new energy vehicle development industry, it can also promote the high-quality development of the new energy vehicle industry and the survival of the fittest in the industry.

Tan et al. (2022) concluded that China's new energy vehicle industry has defects in policies, market mechanisms, control technologies, and infrastructure [1]. From domestic research, Li and Lian (2024) showed that the subsidy reduction policy has a certain negative impact on corporate performance in the early stage, but in the long run, the policy can stimulate companies to improve their core competitiveness and promote performance improvement [2]. Liu 's research (2022) can also support the above view [3]. Han et al. (2022) concluded that suppliers should pay more attention to independent research and development strategies during the subsidy reduction stage [4]. Wang and Li (2021) showed that subsidy policies promote the growth of the number of new energy vehicles [5]. Li and Xiong (2021) used the double difference method in their research and concluded that government subsidies for the new energy vehicle industry can encourage companies to increase their R&D investment and the incentive effect on passenger car companies is more obvious [6]. Some companies have defrauded subsidies by falsifying production data or sales data, or repeatedly applying for subsidies with shell companies or subsidiaries. Bai and Meng (2018) proposed that the government's incentive policies for emerging industries such as the new energy vehicle industry should build diversified countermeasures based on the development stage of the industry and the differences in goals and that the policy should be adjusted or withdrawn at appropriate times depending on the policy effect, so as to minimize the incentive constraint loss effect [7]. This also corresponds to one of the factors that led to the subsidy decline. Wang and Zhang (2024) found that the incentive effect of subsidies on consumers' purchase of new energy vehicles is gradually decreasing [8]. Li et al. (2019) showed that the complete withdrawal of government promotion policies is likely to lead to a sharp drop in demand [9]. This also laid a theoretical foundation for the gradual increase in sales of Tesla, a foreign-funded enterprise, compared with domestic BYD after

the subsidy ended. Tu and He (2024) showed that when the subsidy decline was just implemented, the innovation performance of new energy vehicles declined significantly [10]. However, as the subsidy amount gradually decreased, the new energy vehicle industry began to no longer rely on fiscal subsidies.

Existing literature provides references for studying the impact of the subsidy reduction policy on Tesla's market performance in China, but the current research has defects such as a long time period and changes in data at different stages. Therefore, this paper takes the subsidy reduction policy as the research background and Tesla's market sales as the research object and uses time series analysis and multivariate regression analysis methods to systematically study the data to make the research more scientific. The focus is on studying the impact of the subsidy reduction policy on Tesla's sales data in China, providing a certain basis for the implementation of the subsidy reduction policy, and at the same time providing a reference for the future development of the new energy vehicle industry.

3. Research Design

3.1. Data Source

Tesla's quarterly and annual financial reports are one of the largest data sources. As a listed company, Tesla's financial reports can provide detailed financial information, such as profits, costs, income and expenditure, etc. This paper will analyze the financial data before and after the subsidy reduction policy to observe the changes in Tesla's performance in the Chinese market. In addition, industry reports can also be used as an important data source. For example, institutions such as Bloomberg and the China Association of Automobile Manufacturers will publish relevant market research reports. Other crucial metrics to consider when considering how the subsidy reduction strategy has affected Tesla's market performance are sales figures and adjustments in the company's market share in China. These data can be obtained through data platforms such as the Passenger Car Market Information Joint Conference (CPCA), Statista, and Dashi Data, which include information such as sales, market share, and user preferences of various brands. Due to the frequent adjustments in China's new energy vehicle subsidy policy, it has implications for both consumers and manufacturers. To precisely assess how the discontinuation of subsidies might impact Tesla, this study also collected policies and announcements issued by government departments such as the Ministry of Industry and Information Technology of China and the Ministry of Finance. Finally, the study also collected Tesla management's response to subsidy changes.

3.2. Econometric Model

First, this paper uses time series to analyze Tesla's market performance before and after policy changes. This study mainly collects Tesla's quarterly sales, revenue, and expenditure in the Chinese market from 2017 to 2023. For example, according to the data of the Passenger Car Market Information Joint Conference (CPCA), Tesla's sales in China in 2021 were about 321,000 vehicles, and rose to about 440,000 vehicles in 2022. Although sales have increased, the growth rate has slowed down relative to local competitors, indicating that the subsidy reduction has had a certain inhibitory effect on Tesla's expansion in the Chinese market. In addition, BYD's sales in the same period increased from 593,745 to 1,868,543, further indicating the strong performance of domestic brands in the context of reduced subsidies.

Second, a multiple regression model is constructed in the study. The formula of the multiple linear regression model is as follows: Taking Tesla's annual sales as the dependent variable (AS), the average subsidy amount (S), competitor sales (CS), and oil prices as independent variables (FP). Is the intercept, which is the expected value when all independent variables are equal to zero. …, are regression coefficients, which are the impact of each independent variable on the dependent variable. Is the error term, which refers to other random factors that cannot be explained by the model.

Through the regression model, it can be calculated that: =357145.97, =-115269.89, =0.1213, =-938.42. It can be concluded that when other variables remain unchanged, the subsidy amount and oil

price coefficient are both negative, which means that the decline in subsidies and the rise in oil prices are likely to have a negative impact on Tesla's sales. The sales coefficient of competitor BYD is positive, showing a positive sales relationship with Tesla.

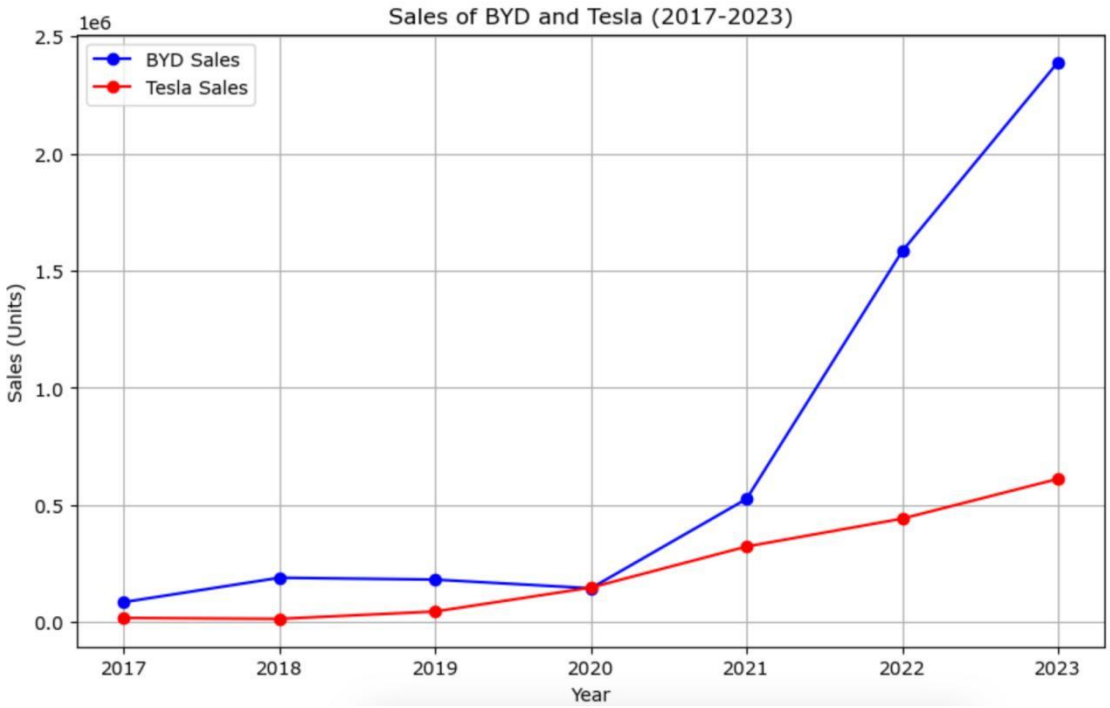

Figure 1. Sales of BYD and Tesla from 2017 to 2023

There are also some special external factors that will affect the sales of Tesla and even most new energy vehicles in China. As shown in Figure 1 for 2020 and 2021, it can be found that due to the impact of the COVID-19 epidemic in 2020, the international oil price fell, which directly affected consumers' consumption of new energy vehicles. In 2021, when oil prices rebounded, the sales of new energy vehicles increased significantly. For example, in 2022, affected by the international energy crisis, oil prices rose significantly. However, comparing the sales of the previous year, it was found that BYD's sales increased significantly from 525,857 vehicles to 1,583,220 vehicles, and Tesla's sales increased from 322,564 to 1,583,220 vehicles. 441,697, but compared with 2020, there were about 60,000 fewer vehicles. It can be reasonably guessed that the huge sales gap is caused by the market positioning and price differences between the two brands. Because BYD's models have broader price coverage, especially in the mid-to low-end market. However, the prices of Tesla's main models such as Model 3 and Model Y are relatively high, and the number of Tesla models is also much smaller than that of BYD, leaving consumers with fewer choices. Secondly, there are supply chain stability and production capacity issues. Since China's new energy vehicle subsidy policy tends to support locally produced vehicles, imported models are generally not eligible for subsidies. Therefore, in 2019, Tesla set up a super factory in Shanghai to enable its Model 3 and Model Y to be produced locally in China, thereby complying with China's subsidy policy conditions. This provides Tesla with price competitiveness in the Chinese market because its vehicles can be sold at more attractive prices after receiving subsidies. Tesla's Shanghai Gigafactory has received support from the Shanghai Municipal Government. It not only enjoyed preferential policies such as land and tax during the construction of the factory but also received policy support from the local government during its operation. Therefore, it can be seen that the sales volume in 2020 after Tesla's Shanghai Gigafactory officially started operations was the year closest to BYD's domestic sales. However, as a domestic company in China, BYD is more localized than Tesla and has a more stable supply chain. Therefore, it has been relatively less affected in terms of production capacity delivery, and may even be expanding. The third point is that the Chinese government’s new energy vehicle subsidy plan, which is scheduled to end in 2022, will have a greater impact on high-end models, which prompts

consumers to be more inclined to choose relatively low-priced new energy vehicles, which is a good thing for Tesla. Being in a disadvantaged market position. At the same time, the epidemic in 2022 may also cause Tesla to encounter challenges in production and delivery.

4. Discussion

According to the aforementioned facts, the subsidy policy did help promote new energy cars in the beginning, but as the subsidy decreased, market competition progressively changed to one that relied on price, brand, and technology. However, in 2022, Tesla's sales growth rate was lower than BYD's under the background of rising oil prices. This phenomenon reveals the differential impact of brand positioning and market price range. Tesla's main models in China are relatively expensive, while BYD covers the mid-and low-end markets, making the latter more price competitive. At the same time, during the pandemic in 2022, Tesla's production and delivery faced certain challenges, while BYD had more advantages in production capacity with its localized supply chain, ensuring a relatively stable market supply. Some suggestions can also be given for this. For the government, while gradually canceling subsidies, it is necessary to consider the long-term development of the new energy vehicle industry and continue to support the healthy development of the market by optimizing tax exemptions, charging infrastructure construction, and other measures. Especially during the policy transition period, the design of subsidy policies should be differentiated for different market segments and brand characteristics to avoid excessive impact on the high-end or low-end market. For new energy vehicle companies, under the background of subsidy decline, companies need to strengthen technological innovation and cost control to enhance their competitiveness. High-end brands such as Tesla should consider expanding their product lines and launching more price-competitive models to cover a wider range of consumer groups. In addition, establishing a solid supply chain to ensure stable production capacity and delivery is also crucial to cope with external shocks. For consumers, the decline in subsidies has made the market more transparent, and the prices of new energy vehicles have gradually reflected their true market value. Consumers can pay more attention to the technical performance and brand value of the vehicle when buying a car, so as to choose the model that suits them in a competitive environment. In summary, the subsidy decline policy has had multiple impacts on Tesla's market performance and has also brought about a new market competition pattern. New energy vehicle companies should adapt to policy changes and enhance their own competitiveness to achieve sustainable development in the process of marketization.

5. Conclusion

This study analyzes the impact of China's new energy vehicle subsidy reduction policy on Tesla's market performance, and draws several conclusions based on data and multivariate regression models: First, Tesla's sales are somewhat impacted negatively by the decrease of subsidies. The reduction in subsidies has weakened the price advantage of high-end new energy vehicles, making some price-sensitive consumers more inclined to choose local brands such as BYD. Second, the demand for new energy vehicles is significantly impacted by changes in the price of oil. When oil prices rise, new energy vehicles are more popular with consumers due to their fuel-saving advantages. Finally, Tesla's market performance is also affected by the stability of its supply chain and production capacity.

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