

Research on Tesla's Pricing Strategy in China Based on Bertrand Game and SWOT Analysis

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Abstract. With the advent of the post-subsidy era, new energy vehicles are the future development direction of China's automobile industry, the Chinese government has established a number of New-Energy Vehicle (NEV) market stimulus programs. As a foreign car company in China, The price approach employed by Tesla in the Chinese market has turned into an important concern. This article analyzes the future pricing development strategy of the NEV industry represented by Tesla in China, and then analyzes the development trend of electric vehicle companies under different pricing. Using the method of combining SWOT and Bertrand model, a strategic analysis is carried out from two different perspectives, this article focusing on using the SWOT analysis method to conduct a strategic analysis of the overall environment of Tesla's NEV industry with various literatures as the model background, and proposes the future Continue technological innovation, improve production efficiency, reduce production costs and other related development suggestions.

Key words: Tesla, pricing strategy, SWOT, Bertrand model.

1. Introduction

1.1 Research Background

With the increasing environmental pollution problems around the world, in order to achieve a global agreement has gradually developed about the auto industry's sustainable growth and the marketing of modern, powerful automobiles. Tesla is a global leader in the new-energy vehicle sector, and as such, its products have a clear competitive advantage on the global market. Additionally, its workforce has real R&D and revenue skills. In terms of market positioning, Tesla can accurately grasp the psychology of consumers and gain a good reputation and consumers after the release of different products. In terms of pricing, Tesla's selling price is constantly changing at any time due to the cost of raw materials. But it was Tesla's pricing at different times that caused significant differences that led to different experts to study its future direction. Making too many cheap cars could cost it market share, and it remains to be seen whether Tesla will return to its original high-priced production vehicles and continue to hold market share. This paper systematically analyzes the future pricing development strategy of Tesla as the representative of the NEV industry in China through SWOT analysis, and analyzes the development trend of electric vehicle companies under different pricing. Consumers react differently when the market sets a high or low price. Based on the current background of Tesla's competition with other NEV brand competitors in China's NEV market, a Bertrand model is established to analyze how Tesla should reduce technology costs in the future Chinese market.

1.2 Literature Review

At present, there are a large number of literature reviews on Tesla's pricing strategy, including SWOT analysis and Bertrand model analysis. In the analysis of Tesla's 4P marketing strategy, Qian Zhichao and others pointed out that in the context of China's vigorous development of the sustainable development of the green environmental protection industry, the Chinese government is constantly

promoting NEVs, and China has provided Tesla with good development environment. At the same time, it also pointed out that Tesla's high-priced positioning may not be suitable for the development direction of China's NEV market in the future, so Tesla should do a good job in market analysis to deal with future changes [1]. Li Xiaomin and others analyzed the impact of NEV technology progress on consumer demand in 15 countries. It is concluded that advanced technology can enable consumers to overcome all kinds of concerns about NEVs, such as mileage anxiety, safety assurance, etc., which can increase the market demand for NEVs, among which the improvement of battery technology has a particularly obvious impact on demand [2]. Li Wenxin and others used the SWOT analysis method to discuss Xiaomi's entry into the NEV industry. Based on the analysis of its own advantages and disadvantages and the opportunities and challenges it faced, they proposed that Xiaomi should adopt S-O in the early stage of entering the NEV industry. Based on this, it puts forward specific suggestions such as strengthening strategic cooperation in the industrial chain, realizing complementary advantages, implementing strategic quality cost management, ensuring product quality, increasing investment in research and development for core technologies, giving play to marketing advantages, and expanding brand influence [3]. Geng Jiwei uses SWOT analysis method to gives reasonable suggestions for key issues and provides a basis for the further development of NEVs [4]. Shang Kui analyzed the internal and external marketing environment of an automobile company. Using PEST analysis, SWOT analysis, and then through STP strategic analysis to find its market price positioning problem. In the context of new energy, Li Linzhi studies the pricing and subsidy strategies of the automotive supply chain from two parts. The first part deals with pricing and subsidy strategies in the automotive supply chain when considering consumer preferences. The second part is the issue of pricing in the automotive supply chain and government subsidy strategies when considering the increase in cruising range [5]. SWOT analysis was also utilized by Zhao Hongxia and Tian Meng to examine Tesla's progress in the Chinese market, learn from its successful marketing strategies, and enlighten Chinese NEV businesses. [6]. Through the research and analysis of "Tesla marketing model", Tang Tianlong understands the marketing model of Tesla vehicles, and discusses the promotion of NEVs in its marketing system from the perspective of the marketing model and customer value core [7]. In the articles of Zhang Yingnan, Liu Yanhong and Wang Jianye, the Bertrand model is used to analyze the pricing problem of the oligopolistic market. This paper analyzes the bidding strategies of manufacturers in the oligopolistic market from two perspectives and differentiated products, so that the Bertrand model is used to analyze the effectiveness of the oligopolistic market with price as a decision variable [8]. On the basis of the above research, this paper further uses SWOT analysis method, Bertrand model and other research methods to make Tesla's pricing strategy and game in the future NEV industry.

2. SWOT Analysis

2.1 Advantages

2.1.1 Tesla has advanced battery technology

Advanced battery technology is the key to whether car companies can gain a firm foothold in the market. Tesla uses the best batteries in the current industry, and with its excellent battery management system, the battery life and stability of the vehicle are improved. These technologies are ahead of other competitors in the current Chinese NEV market. Tesla announced the purchase of a 79% stake in Maxwell, a manufacturer of supercapacitors, in early February 2019. Maxwell's new lithium-ion electrode technology may allow batteries to have energy densities greater than 300 Wh/kg or even 500 Wh/kg, and this A figure increases by 15% to 25% over the duration of two to three years. At the same time, battery costs will be reduced by 10% to 20%. The performance and lifespan of the battery has been improved while the cost has dropped. Compared with China's new power and new energy car companies, Tesla has an advantage in battery technology.

2.1.2 Tesla has a self-developed highly intelligent vehicle system

At present, Tesla's high-performance version in the Chinese market is already equipped with AMD Ryzen processors. This implies that Tesla has integrated the desktop PC's computer capacity inside the vehicle, and this collection of incredibly smart cockpit gear has once again redefined the standard for automobile intelligence. The powerful computing power enables the vehicle to quickly face the complex road conditions during autonomous driving. At the same time, Tesla's car and the Internet are closely linked, and OTA upgrades can be performed anytime, anywhere. Each upgrade will bring more complete functions to users, such as the optimization of automatic driving, the addition of entertainment functions and so on. Compared with other new power car companies, Tesla's car system is at the leading level in the industry [9].

2.1.3 Tesla has excellent industrial design

Through vertical integration within the Tesla team, the technology and production process within the company can achieve the integration of multiple products and realize the state of multi-purpose or common parts, which not only enables production the efficiency is greatly improved, and the cost can be reduced as much as possible. For instance, many Model S vehicle parts are also appropriate for the Model X, and more than half of the Model 3 car parts may also be utilized to produce the Model Y, so the flexible manufacturing ability to reduce costs and increase production allows Tesla to price in many cars. Enterprises stand out by continuously lowering prices. At present, With some cost advantages, Tesla has developed plants in the US, Europe, and Shanghai as part of its aim to become the largest battery maker in the world; and Tesla's pricing is very transparent, and there are corresponding The list of additional costs, such as loading and unloading costs, customs duties or various value-added taxes, can make purchases clear for all consumers [10].

2.2 Weakness

2.2.1 There are problems with the quality of Tesla's products

After Tesla built a factory in China, consumers raised a lot of questions and complaints about the quality, brake failure and other technical problems of domestic Teslas. There are also problems such as the cost of hidden dangers and frequent failures. The recent spontaneous combustion accident of Lin Zhiying driving a Tesla Model X on the road has attracted everyone's attention. This negative news has greatly reduced consumers' confidence in Tesla. Enthusiasm also objectively reflects that the product quality needs to be improved. If Tesla cannot restore its public image and improve product quality in a timely manner, future sales may gradually decrease [11].

2.2.2 Limitations of Tesla-related consumer groups

The early stage consumer group was positioned in the middle and upper class since Tesla was positioned as a high-end product. Moreover, Tesla has gained the initial customer group with a sense of technology, which leads to this kind of customer group may not be too concerned about whether Tesla has excellent product quality and reliability, but its technology's results. They only care if the current automobile is outfitted with the most cutting-edge technology and Internet intelligent equipment, and whether it is hip enough, just like many consumers who follow Apple's products. They are more motivated to spend a modest portion of their available cash. Choosing this cutting-edge product puts customers at the forefront of the fashion, which in turn limits the things customers can modify, like your vision or your mood, which makes most consumers of Tesla products limited to the middle and high class or 24 to 30-year-old youth group.

2.2.3 The incompatibility of the Tesla charging protocol is still widespread.

Many owners of Tesla's new national standard in the Tesla forum are dissatisfied with the incompatibility of the Tesla charging protocol. The operating new national standard charging piles are often disconnected or unable to charge when charging, which shows that Tesla's new national standard adapter still has many technical loopholes. At the same time, behind the mismatch of the

charging port is the mismatch of the standards of the connecting device. To solve this problem, Tesla needs to actively meet the domestic standards [12].

2.3 Opportunities

2.3.1 China's NEV market has huge potential

As the world's largest auto market, China also has huge potential in the development of NEVs. At the same time, Chinese consumers' demand for energy saving and emission reduction is becoming more and more urgent, and the trend of Chinese people's desire to own a private car will continue. China's acceptance rate for electric vehicles is as high as 86%, compared with 35% in Germany and 28% in France, which clearly demonstrates that China is still a significant development market for electric vehicles. According to the research report of Continental Group, nearly 60% of the respondents stated that they either currently own or plan to purchase a private vehicle. The government also supports NEVs. This will give Tesla ample opportunity in the future.

2.3.2 The Shanghai Gigafactory has been completed

Tesla was previously in a situation of limited manufacturing capacity, restricted financial flow, and even on the edge of bankruptcy before the Shanghai facility was finished. In collaboration with the Shanghai Municipal Government and the Shanghai Lingang Management Committee, Tesla inked an investment agreement for a project using only electric vehicles in July 2018. The Shanghai Gigafactory of Tesla started pilot production in November 2019. The Shanghai Gigafactory went from being an empty lot to being finished and producing in just 10 months. In January 2020, the model 3 manufactured in the Shanghai factory began to be delivered to social users. In 2020, Tesla's global production volume was 509,000 vehicles, an increase of 144,000 vehicles from the previous year - and the annual output of the Shanghai plant was 144,000 vehicles that year, which means that all of Tesla's increased production capacity that year was 144,000 vehicles. From the Shanghai factory, the localization percentage of Tesla's Shanghai Gigafactory will reach roughly 90% by the end of 2021. With most of the raw materials and components coming from Chinese suppliers, this also greatly reduces Tesla's production costs.

2.4 Threats

2.4.1 Fierce competition in China's NEV industry

Traditional car companies have a longer brand history than Tesla, so the NEVs of traditional car companies will be more recognized than Tesla. At the same time, they have more complete infrastructure, basic accessories, and supporting services than new power car companies. At the same time, compared with pure electric NEVs, some consumers will prefer hybrid models launched by traditional car companies. At the same time, the price of new energy models sold by traditional car companies is concentrated at around 200,000 yuan, which has also put some pressure on Tesla in terms of price.

2.4.2 Chinese companies have industry-leading battery technology

The new energy of automobiles is one of the new energy trends. "Three-electrical technology" - battery, motor and electronic control, is the most important core of NEVs. Since the state issued a series of policies for the development of NEVs, the core technologies related to NEVs in China have been continuously enhanced. Major Chinese automakers have achieved the three-electric technology of NEVs with the assistance of the government and the research and development efforts of significant industries, laying a solid basis for the growth of NEVs in China. The three-point technology among them places a lot of emphasis on battery technology. Lithium battery technology in China has advanced quickly, and companies like Contemporary Amperex Technology Co. Limited (CATL) have become market leaders. This has enhanced the advantages of Chinese companies in the new energy industry. SWOT matrix analysis results are summarized in Table 1.

Table 1. SWOT matrix

	Strengths: 1.Advanced battery technology. 2.Highly intelligent vehicle. 3.Excellent industrial design	Weaknesses: 1.There are problems with the quality of Tesla's products. 2.The limitations of Tesla-related consumer groups. 3.The incompatibility of Tesla's charging interface still exists widely.
Opportunities: 1.China's NEV market has huge potential 2.Shanghai super factory has been built	Continuous technological innovation to improve production efficiency and reduce production costs	Strengthen publicity and take advantage of production capacity to reduce product prices
Threats: 1.China's NEV industry is highly competitive 2.Chinese companies have industry-leading battery technology	Actively develop products and increase the competitiveness of products	Increase product quality supervision, in line with domestic charging port standards

3. Bertrand Model

Assuming that there are two brands in the current Chinese NEV market, Tesla and its competitors, the total output of the two parties is Q_1 and Q_2 respectively, the prices of the two parties are P_1 and P_2 respectively, and the market demand curve is

$$P=100-(Q_1+Q_2) \quad (1)$$

Suppose both carmakers have the same marginal cost as:

$$MC_1=MC_2=6 \quad (2)$$

In the case of similar performance in all aspects of the product, consumers will tend to go to purchase the lower-priced products. Therefore, the auto manufacturers that offer relatively lower prices will occupy more of the market, and conversely, the sales of higher-priced vehicles will be significantly reduced, thus leading to competition in the market. As the NEV market is still in an early stage of development, each vehicle company aims to occupy more market share. At this time, businesses will set the price of their products at the same value as the marginal cost, at which point the Nash equilibrium is reached. The industry produces 94 units, and the two firms produce 47 units each. At the same time, since the pricing reaches the marginal cost, both firms have zero revenue. If one of the auto manufacturers does not reduce the price, then it loses the demand from consumers in the market and thus loses the market. The game is a repeat of the prisoner's dilemma game between Tesla and the competing car companies. If both sides want to get the best total benefit, the revenue of both car companies must be maximized, which means the container handling pricing of both ports must be at a higher level. But it is difficult to achieve such an outcome without negotiation and collusion. According to Professor Robert Axelrod's analysis of the strategy of the Prisoner's Dilemma game, "tooth for a tooth" is the best strategy for the players in the game without negotiation. In the case that Tesla's competitors set high prices, Tesla and the competing car companies cooperate with each other, then Tesla will also set high prices, so that both sides can gain more benefits; but once Tesla destroys the partnership and chooses to lower prices, through lower prices to get more sales to achieve the purpose of market share, then the competitors will also lower prices in response. So if Tesla can reach an agreement with competing car companies, the "tooth for a tooth" high pricing strategy can be achieved. But because the new energy industry is currently made up of so many car companies, it is difficult to reach a long-term cooperation. Tesla will not keep the same pricing for a long time, because the car companies need to reduce the price to maintain their market share. In this case, if a car company can improve its technology or production capacity to reduce marginal costs, it

can capture a significant portion of the NEV market and benefit more from increased sales. Although the price competition is irrational, Tesla can differentiate itself from the fierce competition through its excellent production capacity. Through the above analysis of Tesla's SWOT can conclude that Tesla's advantage lies in efficient industrial design and manufacturing, so in the future development should continue to improve their technology to reduce the selling price to achieve the purpose of market share.

4. Conclusion

This paper concludes that the main advantage of Tesla in China's NEV market through SWOT analysis is that the overall construction design of the car can help them optimize the cost of production to gain more profit; at the same time, in the face of the competitive pressure brought by the emergence of new Chinese car companies and the government's protection of domestic brands, they should continue to innovate and improve their product performance, such as the development of a longer-lasting battery and more reliable self-driving technology to attract consumer demand. The later Bertrand model analysis is a very effective method for modern decision makers to analyze market strategies, and helps car companies to analyze economic activities in the market to make optimal decisions in the NEV market. In this relatively NEV market, which is still developing, each vehicle company has its own goal to capture the market. In this environment, the best strategy is to collaborate among companies to obtain the desired benefits between them. But the current market has many players, which makes cooperation difficult to form. Therefore, when the two players in the game are rational and the interests of the parties will choose to reduce prices at the same time, so that consumers get a lower price but neither side can successfully take a greater advantage in the market. In the analysis of Bertrand's model, it is concluded that Tesla should continue to play to its strengths and improve its vehicle manufacturing technology through innovation to reduce production costs and prices in order to gain an advantage in the new energy market. In this paper, SWOT analysis is only one of the methods to analyze the development strategy of the company, and we can combine PEST analysis and STP theory to make the paper more informative in the future. In conclusion, as more companies join the field of NEVs, the competition between car companies in the market will become more and more competitive. Consumers' willingness to buy NEVs is also influenced by several aspects, including the current public opinion and consumers' personality, which are not taken into account in this paper. In a follow-up study, this study can expand the study to examine several factors that affect consumers to make a more accurate analysis of Tesla's product pricing.

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