Analysis and Game Study of Tesla's Pricing Strategy Based on Consumer Purchase

Xinxuan Zhang [1, *]

[1]College of Social Sciences, University of Glasgow, Glasgow, The United Kingdom.

*Corresponding author: 631301120319@mails.cqjtu.edu.cn

Abstract. As China's new energy vehicle industry continues to improve, Tesla, the industry leader, will face gradually increasing competitors and will need to make price adjustments to adapt to the market in addition to improving its products. Tesla needs to increase its product range appropriately and diversify its product line to meet the needs of different consumers. This study makes recommendations for Tesla's pricing strategy, with the aim of continuing Tesla's lead in the fast-growing Chinese new energy vehicle market. This paper positions the consumer group of the Tesla brand through market segmentation and analyzes its pricing method's advantages and influencing factors. The relationship between whether Tesla raises its price and whether consumers buy is discussed in the game matrix and Nash equilibrium model through the game theory method combined with the actual situation. The result is that most consumers will buy the Tesla brand even if the price of Tesla increases and give suggestions for future development.

Keywords: Game; Tesla; Pricing Strategy.

1. Introduction

1.1 Research Background and Significance

China's rapid economic growth and social development have brought enormous pressure on the ecological environment, and problems such as global warming and the reduction of non-renewable energy are affecting people's lives. Therefore, new energy vehicles, which use sustainable energy as fuel and have energy-saving and emission-reducing features, are gradually coming into the public's view. Among them, the long-term vision of the Tesla brand is in line with the environmental protection concept proposed by China. Since it entered China in 2014, it has made full use of marketing tools to adapt to the environment, leading in sales year after year compared to similar cars, making China its largest overseas market. In recent years, due to the impact of Covid-19 on China, people are travelling less, resulting in a decline in car sales. And coupled with the fact that Tesla has introduced driverless kung fu with safety issues and needs to make immediate changes in performance and price to secure its market position, this paper gives suggestions regarding Tesla's pricing strategy.

1.2 Literature Review

One of the main factors for the rise of the Tesla brand in the Chinese market is its unique marketing strategy. Xu (2017) argues that Tesla's success relies mainly on repositioning the electric vehicle market, focusing on electric vehicles characterized by luxury and individuality, and creating a brand image through the advantages of noiseless driving and interior design with a technological touch [1]. Jiang's (2021) study points out that Tesla achieves total consumer market share and advertising coverage through new media communication mechanisms [2]. However, Ding et al. (2022) argue that Tesla has a marketing ethics crisis in China due to the sensitivity of Chinese consumers to whether their personal opinions are valued and propose a solution through a "seven-step decision-making model to solve ethical problems" [3]. In addition, both the epidemic and the rise of domestic brands have significantly impacted Tesla's Chinese market. Jiang (2022) compares the marketing models of BYD and Tesla under the epidemic, which have different market positions, and suggests ways to increase the added value of the products in the future [4]. Previous literature has discussed Tesla's brand positioning and marketing strategy in detail. Still, there is a gap in the analysis of the game between pricing strategy and consumers with Tesla, so this paper aims to fill this gap through research.

2. Tesla Brand Consumer Group Positioning

2.1 Market Segmentation

In terms of the market area, Tesla is a pure electric car located in the city [5]. The driving distance is shorter compared to fuel cars? In addition, electric vehicles also need smoother road conditions, so choose the Pearl River Delta, Yangtze River Delta and Beijing-Tianjin-Hebei cities, where the charging network is more developed, and the road conditions are better.

In terms of consumer income, the number of Chinese middle-class people is relatively large. Still, the number of high-income people is relatively small, so we can produce high-grade pure electric coupe to meet the needs of high-income people and get the brand effect in the early stage. And have middle-grade pure electric coupe for middle-income people in the later stage.

In terms of consumer psychology, the "post-80s" and "post-90s" have become the largest customer group in the Chinese auto market, and this group pursues fashionable and pays attention to technology. However, according to Tesla's current price, this group's overall consumption-ability is not enough.

2.2 Consumer Orientation

Tesla is mainly committed to creating new energy high-end cars, so the buyers of Tesla cars usually have certain purchasing power and pursue the car's performance, requiring the car's unique appearance and functions. They pay attention to environmental protection, have new ideas, and are very active and curious about new things. Tesla can meet consumers' needs by targeting them with targeted advertising.

3. Analysis of Pricing Strategies

3.1 Brief Description of Pricing Strategy

Tesla Motors initially adopted a high-priced pricing strategy and marketed itself as a luxury sports car. So Tesla cars target the consumer market to pursue high quality of life for high-end people. The highest price among the main series of Tesla is the model X series, and the lower price known by the general consumers is the model S series, whose main models in China are at least 1 million. Therefore, the consumer market population of Tesla cars is mainly upscale consumers [6]. 2016, Tesla launched the MODEL3 economy car, catering to a relatively low consumer population, primarily taking a similar skimming pricing method. In the case of market opening, the high price policy can enable the company’s investment to be recovered quickly, thus reducing the company’s risk. However, the high price policy cannot be maintained for a long time, and once competitors enter the market, it will cause sales to decline. Therefore, the Tesla brand first raised the price to earn high profits from some consumers and then gradually lowered the price to seize the market and increase the market share, aiming to maximize profits.

3.2 Advantages of Tesla’s pricing approach

The cost of a new product is enormous for the Tesla brand, and companies often want to make substantial profits as soon as possible after the new product is launched. The skimming pricing method recovers its investment costs as soon as possible. For consumers, price is a very important factor affecting their desire to buy. The Tesla brand’s high pricing can attract the high consumer crowd, mainly to capture the consumer’s pursuit of brand-name luxury psychology. The most basic requirement at the beginning of the pricing of a new Tesla car product is that the selling price should cover the cost, and a certain profit can be made. Therefore, the final pricing of the product is based on the calculation of various costs plus the company’s target profit. The skimming pricing method can achieve higher profits at the beginning of the product launch with a higher price.

3.3 Analysis of factors affecting pricing strategy

Suppose the enterprise's labor productivity is low, and the technology and capital are not enough to increase production on a large scale [7]. In that case, it should choose a high price strategy to prevent the increase in demand brought about by low prices. In recent years, Tesla brand production efficiency is in the United States first, can expand production scale in a short period, can cope with the increased demand brought about by the demand for production capacity, so choose to lower the price in the model3 series. The degree of difficulty in mastering a new product's technology primarily affects the market's competition. Suppose a new product's production and design process is relatively complex and not easily grasped by competitors. In that case, it is difficult for a company to easily imitate it at this time, and the company can choose to price it at a high skimming price without considering the threat of competitors and substitutes. Thus, Tesla chose to sell at a high price when it first entered the Chinese market, but later, with the rise of new domestic energy vehicle brands, many competitors and substitutes emerged, thus lowering the price.

In addition to the price and quality of the product itself, new products entering the market must also consider the nature of the product and frequency of use, etc. Tesla makes new energy vehicles, which are in line with the energy saving and emission reduction proposed by the World Health Organization and meet the environmental protection concept of consumers. The company's image in the minds of consumers affects the attitude of consumers towards the company's products. A socially responsible and public-spirited corporate image is more likely to make consumers accept higher product pricing. At the same time, the positioning of the brand and product prices are also influenced by each other [8]. The better the brand of the company's products in the pricing will be less bound to consumers for the brand identity can increase the product's profits and help companies improve product pricing. At the same time, the high price is also a symbol of a high-end brand, improves customer recognition of the product, and less consideration of the product price.

4. Game Analysis of Tesla and Consumers

The Tesla brand needs to consider the consumer's ability to accept the price when setting the price to determine whether the consumer can consume according to the pricing. According to supply and demand theory, it is known that price increase has an inverse relationship with demand. A price increase may cause consumers not to buy or to choose other brands, so whether the price increases and whether consumers buy form the basis of the game process [9]. Since this paper only analyzes the consumer market of Tesla in China, other brands are not considered for the time being [10]. Therefore, it is assumed that there are two players in the market: the Tesla brand and the consumers, and both parties are rational. The Tesla brand can raise the price or keep the original price, and consumers can choose to buy or not buy enough. Tesla needs to consider the behavioral movements of consumers before implementing its pricing strategy, and consumers need to consider whether their purchasing power matches that of the brand.

This study makes the following assumptions: when Tesla first entered the Chinese market, and it is the only relatively mature brand of new energy vehicles, the selling price was P1, the cost was C, the increased price was I, and after the price increase is

$$P_2=P_1+I \tag{1}$$

when the price is not increased the profit is

$$R_1=P_1-C \tag{2}$$

after the price increase the profit is

$$R_2=P_2-C=R_1+I \tag{3}$$

When the price is increased, consumers buy. Tesla's profit is R_2. Consumers hold a certain amount of money and desire to buy the consumer of consumers in the case of not buying the car utility E, which is based on the utility of consumers holding money generated. If consumers buy without a price increase, they have utility y. At this time, consumers have a total utility of E + y. When the price is increased to buy, consumers will lose a portion of the excess utility t from the price increase. The

total utility is (E + y - t). The above assumptions are greater than 0. This paper uses a matrix model to represent the game relationship between whether Tesla increases its prices and consumers.

Table 1. Price increase matrix model of the game between Tesla and consumers

Concumer	Improve price	Keep price
purchase	(E+y-t, R_2)	(E+y, R_1)
Not purchase	(E, 0)	(E, 0)

When Tesla chooses to keep the original price, the consumer's buying utility is E = U + y. It is greater than the utility of not buying, so the consumer will buy. This situation exists in reality. The profit Tesla receives is R1, and this result is not Nash equilibrium.

When Tesla chooses to increase the price, the consumer's choice greatly impacts Tesla's revenue. The matrix shows that when consumers buy, Tesla's profit $R_2 = R_1 + I$. When consumers do not buy, the profit is 0. When consumers choose, they need to compare the size of (E + y-t) with E, discussing the positive and negative of y-t.

When y-t>0, the effect of consumers choosing to buy is greater than that of not buying, and rational consumers will choose to buy. Tesla will gain profit, Nash equilibrium at this point, and is a pure strategic equilibrium. In real life, most of those who choose Tesla are from the affluent class and do not care how much the price increase is.

When y-t=0, the utility of consumers choosing to buy or not to buy is equal. Consumers will be somewhat unhappy with paying more, but it may be offset by the satisfaction of buying the car that is possible in this reality. As rational people, consumers will still choose to buy, and such consumers may pay more attention to the quality, performance and satisfaction brought by the car, which is also a pure strategic equilibrium. However, consumers may also be attracted to other alternatives and choose not to buy a Tesla.

When y - t < 0, the utility of consumers choosing not to buy is greater than buying. From the matrix, it follows that if consumers buy, then Tesla will choose to increase the price when the profit of Tesla's choice to increase the price is greater than the profit of not increasing the price. And because y-t<0, consumers will refuse to buy in the case of Tesla's price increase, and Tesla and consumers face a second round of choice. Repeatedly, the game between Tesla and consumers cannot reach a balanced state.

China's new energy vehicle industry continues to mature, and Tesla's competitors and substitutes continue to grow. Tesla should adjust its price to adapt to the market and maintain its brand reputation through its high-end product line while satisfying low-end consumers with affordable products.

5. Conclusion

As new energy vehicle options increase in China, Tesla's pricing strategy will also change. Tesla's main consumer group is young people with spending power and currently uses a skimming pricing method to enter the Chinese market at a high price and lower the price as competitors increase. A comparison of consumers' owning utility and paying utility through the game matrix concludes that price changes have little impact on affluent consumers and that most Tesla consumers will pay a high price for performance. Still, the game cannot be balanced when consumers choose not to buy greater than the utility of buying. China's new energy vehicle industry continues to mature, and Tesla's competitors and alternatives continue to grow. Tesla should adjust its price to adapt to the market and maintain its brand reputation through its high-end product line while satisfying low-end consumers with affordable products. There are still some shortcomings in this paper, such as no analysis of the specific pricing of Tesla vehicles, which need to be further explored in future studies.

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