

# Pricing Strategies of New Energy Automobile and Traditional Vehicles in the Post-subsidy Epoch

Yuda Lin<sup>1,\*</sup>

<sup>1</sup>Guanghua Academy-VCA program, Shanghai, China

\*Corresponding author: 631324080221@mails.cqjtu.edu.cn

**Abstract.** With the substantial decline in subsidies for new energy automobile, the domestic new energy car industry has undergone "earth-shaking" changes, and the market scale of these new energy automobiles have continued to decline. Even some auto parts suppliers went out of business. At the same time, with the introduction of Tesla in the Chinese market and the continuous expansion of the market size, the pricing strategy of Tesla in the Chinese market, domestic new energy vehicles and traditional fuel vehicles has undergone tremendous changes, so that the market has Get maximum profit. In this context, domestic new energy vehicles may require government departments and related companies to re-evaluate the market status, redefine new development strategies for new energy cars, and promote the healthy and continuous progress of all new energy vehicles. Based on the tripartite representatives in the oligopoly, namely domestic new energy vehicles, Tesla, and Conventional fuel automobile, a tripartite game model has been planned to discuss the tripartite pricing mechanism in this market competition. The research results found that in the future Chinese market, before the technology of domestic new energy vehicles has completely surpassed the technology of the joint venture industry represented by Tesla, it should try to keep the price as low as possible to obtain high profits.

**Keywords:** New energy vehicles; Tesla; Traditional fuel vehicles; Pricing strategy.

## 1. Introduction

### 1.1 Research Background

In 2007, China released the "Guiding Catalogue for Industrial Structure Adjustment (2007 Edition)", which officially included new energy vehicles that are encouraged to produce, and the development of this new kind of vehicle factors began to be on the right way. The State Council executive meeting held on September 8, 2010 reviewed and approved in principle the "Decision of the State Council on Accelerating the Cultivation and Development of Strategic Emerging Industries", listing this new environmental friendly vehicle industry as one of the seven strategic emerging industries. After 2013, the Chinese government has increased its investment in new energy automobile. The sales volume of new energy vehicles in 2015 in China reached 331,092, surpassing the United States for the first time and becoming the country with the highest sales of new energy cars in the world. In the following three years, it has continued to develop rapidly, with an annual growth rate of more than 50%, and has maintained the No. 1 position in the producing and sailing new energy cars in the world [1]. The strong rise of the automobile industry is due to the continuous breakthroughs in product quality and technology research and development of related companies, and at the same time, it benefits from the strong support of the government departments for the industry, involving funds, venues, traffic, etc., especially financial subsidies. Many policies such as the double subsidy policy of car purchase reduction and exemption of vehicle purchase tax have been adopted. Then, with the help of removing such an invisible "big hand", the development of the domestic new energy vehicle industry has undergone tremendous changes, the overall growth rate has slowed down significantly, and the progress of prospects are uncertain. The competitive advantage in price between new energy vehicles and traditional fuel vehicles no longer exists, and sales have begun to decline significantly since the policy subsidies were removed. At the same time, no major breakthroughs have been made in related core technologies, resulting in a further decline in competitiveness. The introduction of new energy vehicle giant Competition in China's new energy vehicle industry has

become more intense under Tesla's influence and forced new energy vehicle companies in country to innovate and develop. The Chinese market, on the one hand, has optimized the business model and marketing model of China's new energy vehicle industry, and reshaped the industry chain of China's new energy vehicle. The automotive industry chain has put forward higher requirements. On the second day of the China Blue Book Forum, you Zheng, deputy and general manager of Dongfeng Motor Group, An Jin, chairman of Jianghuai Automobile Group, Shen Jinjun, chairman of China Automobile Dealers Association, and Li Weili, deputy director of the Economic Consulting Center of the State Information Center, focused on "survival and transformation, time window" The topic of "how many years" was further discussed. What Amgen is more certain is that new energy vehicles will not immediately replace fuel vehicles, and the two will coexist for a long time in the future. "The development of traditional fuel vehicles and smart electric vehicles will coexist for 30 years. Even after 30 years, we can't say that fuel vehicles will not exist. There are still many special environments, special use environments, and special working conditions. It is also necessary to use fuel vehicles [2]. So the three main companies engaged in a silent battle, the pricing game.

## 1.2 Literature Review

Tesla is the most famous and greatest brand of new energy vehicles in the world. Moreover, Tesla has absolute strength in vehicle control, autopilot, battery life and cruise capability, and other technologies. For example, the thinking of Tesla designers is very advanced. In their efforts to refresh the new energy vehicles in the range and 100 km acceleration of the performance indicators, created a brilliant car sales performance [3]. Compared with Tesla, Chinese new energy vehicle companies are undoubtedly "little brothers" in terms of brand, technology, scale and products. However, driven by Tesla, the entire new energy vehicle has been sought after by capital and the market. In this round of upsurge, China's new energy vehicles are deeply involved and also enjoy dividends. China's development of new energy vehicles does have certain advantages: First, it has a complete industrial chain, second, it has strong market demand, and third, it is supported by national policies [4]. In order to avoid the huge profits of the joint venture industry in China, both Chinese new energy vehicles and traditional fuel vehicles intend to spend more time and money on this aspect in the new energy vehicle manufacturing industry, so in such a transformation Under the trend, their pricing strategy must be very intense.

On the whole, as an emerging field with huge market potential and fierce commercial competition, the cooperative innovation of new energy cars is the result of the joint promotion of multiple parties. Under the strong promotion of the government, Chinese new energy vehicle cooperation and innovation have achieved good results. However, China's current cooperative innovation mainly focuses on obtaining new energy subsidies, ignoring the research and development of key technologies, which is not conducive to the technological progress of the new energy vehicle industry [5].

## 2. Problems Existing in the Current Subsidy Policy for New Energy Vehicles

Under the background of the current post-subsidy era, there is a reason why domestic new energy vehicles cannot be compared with new energy vehicles from foreign companies such as Tesla. That's why now they need to get more profits through pricing games.

### 2.1 Overreliance on Subsidies Leads to Reduced Competitiveness

In 2007, the state implemented the subsidy policy to provide financial subsidies for these enterprises to develop an emerging industry, so that they can develop more efficiently and develop products. During this period, domestic new energy vehicles, such as BYD, BAIC and other large-scale new energy vehicles, directly benefited from them. Currently, they are also a promising category in the domestic market and have a certain influence. However, most of the small domestic new energy automobile enterprises, in the case of insufficient productivity, imperfect system, and insufficient

supply channels, transfer limited subsidies to other expenses, and do not fully play their role. So far, the production capacity of these niche enterprises has stagnated, and there is no sufficient strength to guarantee the production of safe, reliable and excellent cars. At present, there are already several new energy vehicle companies that are unable to operate under government subsidies. For example, Haima Motor has suffered huge losses for two consecutive years, and Zhidou Motor has been auctioned due to excessive debts. But think about these joint ventures, Tesla, BMW, Porsche, Volkswagen, Toyota, and these cars maximize their production capacity through their own development, and the technology level, such as battery cruising range, is leading in this industry. They are still vigorously developing new energy vehicles without subsidies, and soon proposed to seize the Chinese market. These companies are the real hard power, which is why they can continue to develop steadily after China cancels subsidies. In contrast, due to excessive reliance on subsidies, the competitiveness of self-owned brands has not increased but decreased, which has slowed down the overall progress of Chinese new energy vehicle industry [6].

## **2.2 Some vicious companies defrauded subsidies and slowed down development**

These domestic niche new energy vehicle companies not only misappropriated new energy automobiles subsidies, some even cheated a huge amount of new energy vehicle subsidies by falsifying product parameters and related galaxies. This kind of thing keeps happening, which has a huge negative impact on the development prospects of domestic new energy vehicles, and greatly slows down the development of those high-end auto industries. And one after another very serious fraudulent behaviors have made the public opinion pressure on Guoneng new energy vehicles very high, and this makes the pressure of public opinion. On September 8, 2016, the Ministry of Finance disclosed that five new energy vehicle manufacturers including Suzhou Jinxi Bus Manufacturing Co., Ltd. were suspected of defrauding the state funds of more than 1 billion yuan in financial subsidies, including Chery Automobile, King Long and other large and well-known enterprises. In view of the serious financial losses, the Ministry of Finance finally canceled the qualification for financial subsidy declaration of Suzhou Jimxi Bus Manufacturing Co., Ltd. and recovered all the subsidy funds. At the same time, the Ministry of Industry and Information Technology canceled its vehicle production qualification, and the remaining 4 enterprises were the same the pre-appropriation funds from the central financial subsidy were recovered, and a fine of 50% of the problem amount was imposed according to regulations, and the qualification for central financial subsidy was cancelled from 2016.

## **2.3 Fiscal Expenditure Burden Affects Overall Economic Development**

The central government has spent nearly 100 billion yuan on subsidies for new energy vehicles all of which come from fiscal revenue. There is a fiscal deficit. In 2019, the central budget deficit was 1.83 trillion yuan, and the deficit rate reached 2.8%, which is still within a safe and controllable range.

The local government also subsidizes the new energy vehicle industry. In 2019, the local fiscal deficit was 930 billion yuan, but the local government debt has far exceeded the fiscal gap. As of the end of February 2020, the national debt balance of local governments was 22530.2 billion yuan, which was generally higher than the 60% debt ratio warning line, and the debt ratio of some local governments even exceeded 100%. The situation is grim. The main reason for this situation is that the subsidies for emerging industries such as new energy vehicles are too large and the investment in infrastructure construction cannot be reduced. If subsidies are continued to emerging industries in the future, the local financial situation will further deteriorate, affecting the development of the overall national economy. When the national economy is in recession, people are not very good car dealers in this form, and there must be little demand.

Likewise, Tesla has their problems: First, capacity Problems Insufficient capacity has always been a headache for Tesla, especially Model 3 orders have the highest degree of deviation from production capacity. Since the end of 2017, the problem of Tesla's insufficient capacity has become more serious, and insufficient capacity has also led to shortages and delays. Delivery and other phenomena occur

frequently. The reason for Tesla's capacity shortage is that they rely too much on mechanized production, the production line is too dense, and the production process requires too much machinery and equipment, all of which lead to the rapid increase of cost [7]. Second, quality problems the rough workmanship of the Model S and the quality reliability defects of the Model 3 body reflect Tesla's quality problems. This also led to the frequent occurrence of Tesla accidents in the news.

Since March 2022, affected by the rising prices of raw materials such as batteries, new car manufacturers such as Ideal, Xiaopeng, Nezha, Leapmotor, and Weimar have raised the price of new energy vehicles, with a single increase of more than 10,000 yuan. In stark contrast, the new energy brands of traditional car companies have a small increase, mostly below 10,000 yuan, or have not yet increased their prices.

First, battery price increases are not the only incentive: On March 21, 2022, CATL stated that due to the sharp rise in upstream raw material prices, the company will dynamically adjust the prices of some battery products. "At present, the new energy vehicle brands that have determined the price increase rate of batteries in the second quarter have basically announced price increases. Most of the price increases have not been reached because they have not negotiated the price increase rate with battery manufacturers, and they will increase after negotiation.

Second, the advantages of dealers' price adjustment appear: At present, new car manufacturers are in the stage of rising development, and the overall sales volume cannot reach the volume of traditional car companies. At the same time, the sales and profits of traditional car companies mainly come from fuel vehicles, so they have a strong ability to allocate costs. Zhang Xiang, a researcher at the Automotive Industry Innovation Research Center of North China University of Technology, pointed out: "New car companies have fewer models and are less able to resist cost increases, so the increase is larger than that of traditional car companies."

Third, the price increase of popular models can stimulate sales: It is reported that in 2022, both traditional car companies and new car companies will launch blockbuster models one after another, and the competition in the domestic new energy vehicle market will become more intense. New energy vehicle sales data for March 2022 suggest that the price increase did not affect sales. Among them, Xiaopeng continued to lead the new car companies with sales of 15,414 units, and Nezha was clearly catching up, with sales of 12,026 units in March; Leapmotor also sold 10,059 units. For the already best-selling models, car companies hold a large number of orders, and moderate price increases will not affect their sales, but will play a positive role, which increases the confidence of car companies to increase prices[8].

### 3. Analysis of Three-party Pricing Game

Assumptions: domestic new energy vehicles are priced at up to 10 ¥, low prices are 5 ¥; Tesla's prices are up to 10 ¥, low prices are 5 ¥; traditional fuel vehicles are priced up to 10 ¥, low prices are 5 ¥.

The total profit of domestic new energy vehicles, Tesla, and traditional vehicles is 100 ¥.

Tesla is priced at a high price (10 ¥), and the rest of the domestic new energy vehicles and traditional fuel vehicles have two options, high price and low price. If both domestic new energy vehicles and traditional vehicles choose high prices, their profits will be 20 ¥, 50 ¥, and 30 ¥ respectively (the sequence of domestic-Tesla-traditional cars, the same below).

If domestic new energy vehicles choose high prices and traditional fuel vehicles choose low prices, their profits will be 10 ¥, 35 ¥, and 55 ¥ respectively.

If domestic new energy vehicles choose low prices and traditional fuel vehicles choose high prices, their profits will be 35 ¥, 35 ¥, and 30 ¥ respectively.

If domestic new energy vehicles choose low prices and traditional fuel vehicles choose low prices, their profits will be 20 ¥, 20 ¥, and 20 ¥ respectively.

Tesla is priced at a low price (5 ¥), and the rest of the domestic new energy vehicles and traditional fuel vehicles have two options, high price and low price. If both domestic new energy vehicles and traditional vehicles choose high prices, their profits will be 10 ¥, 60 ¥, and 30 ¥ respectively.

If domestic new energy vehicles choose high prices and traditional fuel vehicles choose low prices, their profits will be 5 ¥, 55 ¥, and 40 ¥ respectively.

If domestic new energy vehicles choose low prices and traditional fuel vehicles choose high prices, their profits will be 15 ¥, 65 ¥, and 10 ¥ respectively.

If domestic new energy vehicles choose low prices and traditional fuel vehicles choose low prices, their profits will be 20 ¥, 50 ¥, and 30 ¥ respectively.

**Table1.** Evolutionary Game Research on Automobile Pricing Strategies

|                              |            | Tesla's High price |              | Tesla's low price |              |
|------------------------------|------------|--------------------|--------------|-------------------|--------------|
|                              |            | traditional car    |              | traditional car   |              |
|                              |            | high price         | low price    | high price        | low price    |
| Domestic new energy vehicles | high price | (20, 50, 30)       | (10, 35, 55) | (10, 60, 30)      | (5, 55, 40)  |
|                              | low price  | (35, 35, 30)       | (20, 20, 20) | (15, 65, 10)      | (20, 50, 30) |

In summary, for domestic new energy vehicles, it is the most appropriate choice to choose a low price at present. In the case of the comprehensive technology level of domestic new energy vehicles, and the after-sales service has not surpassed Tesla or other joint venture vehicles, Lower prices in order to attract more consumers, increase sales, and increase profits.

## 4. Suggestion

### 4.1 Improve R&D Strength and Product Quality

Due to the substantial decline in subsidies for new energy vehicles, self-owned brand new energy vehicle companies have lost the industrial support and protection of the central government, and cannot compete fairly with foreign brands completely relying on their own strength. The advantages accumulated in the early stage have begun to weaken significantly. The research and development strength of new energy vehicle companies is still not high, and there are few advantageous areas such as power batteries, and the lead is not large. Some key technologies such as IGBT and charging and replacement technology are even far behind the world's advanced level. Enterprises still need to further improve their research and development capabilities, and product quality. As long as the product quality of domestic new energy vehicles is improved, and people's recognition of them increases, the output will increase.

### 4.2 Actively Develop Overseas Markets

China's new energy vehicle production and sales have not only grown rapidly in the domestic market, but have also made great progress in vehicle exports. In the first half of 2019, China exported 5,569 new energy vehicles, a year-on-year increase of 99.3%, higher than the overall sales growth rate of 67%. Export has become a new growth point of China's new energy vehicle industry. BYD, Yutong, Geely and other brands of new energy vehicles are among the best in export volume, and are exported to many overseas countries and regions, including the United States, the United Kingdom, France, the Netherlands, Japan, and Canada. In developed countries such as these, it has been well

received by local consumers, and China's new energy vehicle products are gradually being recognized by global consumers [9, 10].

## 5. Conclusion

With the cancellation of government subsidies for new energy vehicles, the domestic new energy vehicle market has undergone tremendous changes. Therefore, I have done research on this phenomenon. Under the circumstance that the domestic new energy vehicle market has been greatly reduced, what kind of pricing strategy should the government make to maximize profits. I've included a table of three-way pricing strategies for this. But why domestic new energy vehicles have undergone such huge changes after the subsidy is cancelled, I have started thinking. First of all, the first reason is that the excessive reliance on subsidies for domestic new energy vehicles in the process of development has led to a decline in competitiveness. Since the domestic government can provide them with a large amount of subsidies, these automobile manufacturers have not spent a lot of money on these vehicles. Therefore, in the case of the cancellation of subsidies, they themselves do not have the strength to produce these auto industries that can compete with Tesla. The second point is that domestic new energy vehicle companies defrauded the large amount of subsidies to be used elsewhere. All these reasons make it difficult for most of the domestic new energy vehicles to gain a foothold in the Chinese market after the subsidy is cancelled. For this unchangeable reality, how did they make their pricing strategy, but according to the three-party game model, we can draw the final conclusion that new energy

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