An In-depth Analysis of Tesla's Growth Deceleration in China's Booming New Energy Vehicle Market: Challenges and Strategic Implications

Ruiqi Chai*

Department of Beijing Technology and Business University, Beijing, China

* Corresponding Author Email: 2108020504@st.btbu.edu.cn

Abstract. As environmental pollution continues to deepen, people's awareness of environmental protection continues to strengthen, and the penetration rate of new energy vehicles has greatly deepened. Tesla, as a representative of new energy vehicles, plays an important role in the global market. However, in recent years, Tesla's development speed in the Chinese market has gradually slowed down. This paper mainly provides experience and reference for the development of new energy vehicles in China by analyzing the reasons for the decline of Tesla's development speed in China.

Keywords: Tesla Motors, BYD Cars, new energy, opportunities, challenges, development speed.

1. Introduction

In recent years, with the gradual emergence of a series of problems, such as environmental pollution and energy waste, people have begun to pay attention to the use of clean energy to reduce waste and pollution. Tesla Motors is one of the representatives of new energy vehicles. Founded in 2003, and listed on the Nasdaq in June 2010, Tesla is an American manufacturer of energy and electric cars, specializing in solar roofing, energy storage technology, and electric vehicles. Martin Eberhard and Mark Tarpenning were the initial founders of Tesla. Elon Musk began working for the company in 2004 and oversaw the A Series A investment round. With a variety of electric vehicles, including the Model S (luxury electric sedan), Model X (luxury electric SUV), Model 3 (midsize electric sedan), and Model Y (compact electric SUV), Palo Alto, California's Silicon Valley-based Tesla has established a high-tech reputation [1].

According to the timeline, Tesla's development process is summarized as follows: Affluent, environmentally conscious clients were the target market for Tesla's first hybrid sports car, which the company set out to develop and sell in 2003. After Musk started providing finance for Tesla in 2004, the company underwent a radical shift in direction. In light of the overall backdrop of the energy crisis, research into the development of new energy vehicles is highly practical. However, the study and development of this new technology and technique will require a substantial investment of time and material resources.

The first Roadster was delivered in February 2008, following five years of technological preparation, and the redesigned Model S was unveiled that same year. After the company made an investment in Tesla in 2009, the US Department of Energy finally became interested in the company's enterprise development. The Department of Energy provided Tesla with 465 million high-interest loans, which not only helped the company overcome its financial challenges but also inspired it to expand into the energy sector. Tesla went public and hired George Blankenship, vice president of retail at Apple in 2010, which shows that Tesla positioned its market model in the direction of retail. Two years later, Tesla built its first Giga factory in California, the same year that the first Model S was delivered.

Tesla declared its first profit in the first quarter of 2013, following a decade of challenging growth that encompassed numerous financial obstacles and technological challenges. As of June 2013, Tesla's market capitalization surpassed 11.8 billion US dollars. In 2015, Tesla embarked on its global market expansion efforts and released job postings in cities including Shanghai, Amsterdam, Milan, seeking technical product talents. Tesla delivered more than 50,000 vehicles worldwide in 2015. In

2016, Tesla acquired Solar City, becoming the world's first and so far, only vertically integrated company in energy. Tesla officially changed its name to "Tesla Motors Inc" in 2017 which indicates that Tesla's business area will gradually expand, not only in the automotive field, but also the goal of entering larger industries. In January 2019, the establishment of Tesla's Shanghai Gigafactory greatly improved the development speed of Tesla in China, making Tesla cars further enter the market of China, and increasing the sales volume. In a relatively short span of over a decade, Tesla has navigated through numerous challenges and arduous explorations, achieving remarkable milestones in financing, governmental support, technological innovation, mutually beneficial collaborations, and various other domains. Consequently, its future prospects for development appear exceedingly promising [2].

Tesla was a representative enterprise of new energy vehicles in the Chinese market. With the completion and operation of the Shanghai Gigafactory, Tesla's sales in China have also been rising. However, in the past two years, Tesla's sales growth in China has not been the rapid trend of previous years. Tesla's annual report shows that in 2022, Tesla's total revenue was 81.462 billion US dollars, of which the annual operating income of the Chinese market was 18.445 billion US dollars, an increase of 33.23%, but its proportion fell from 25.72% in 2021 to 22.27% less than market expectations [3]. In January 2024, Tesla's China sales were only 71,400 vehicles, and the year-on-year growth rate further decreased to 8%. It is worth noting that China's overall new energy vehicle sales growth is still very considerable. In 2023, the sales volume of new energy vehicles in China was 9.495 million, an increase of 37.9%. In January 2024, the sales volume of new energy vehicles in China was 629,000, an increase of 93.3% year-on-year. Horizontal comparison is not difficult to find that Tesla's sales growth in the Chinese market has significantly lagged behind the market [4].

In the context of the rapid development of new energy automobile bazaar in China, the sales growth of Tesla has slowed down mainly because of the fierce growth of local new energy vehicle enterprises in China, which has greatly diverted the market influence of Tesla. With the emergence of a large number of local new energy vehicles in China, they have greatly replaced Tesla with competitive prices and convenient operation. At the same time, in recent years, Tesla's safety accidents have been continuously exposed, and people have a higher pursuit of vehicle safety.

Therefore, with the rise of China's independent research and development of BYD, Xiaopeng, Ideal, NiO and other electric vehicle brands, Tesla's market share in China has gradually declined, and Tesla's growth rate in China has shown a gradual decline.

2. Literature review

2.1. Safety Problems

The National Highway Traffic Safety Administration suggested that Tesla should recall vehicles equipped with the "fully autonomous driving" test software, which may reach more than 360,000 vehicles, because the software may pose a "collision risk" to vehicles in motion. The reason for the recall is that due to inadequate resilience, the software can cause vehicles to exceed the speed limit or drive through intersections in an unpredictable manner that violates traffic laws and increases the risk of collisions. This includes driving or turning through certain intersections during yellow lights and changing lanes in certain turn-only lanes to continue straight [5].

In fact, Tesla's safety problem is not the first time, as early as a few years ago, there were news reports that Tesla caused a variety of safety accidents due to brake failure, and fully automatic driving technology is not mature enough now, people are unknown about its safety, as a major brand of new energy vehicles, Tesla's safety is questioned. This is one of the reasons why Tesla's growth in China has gradually slowed.

2.2. Price Jumps

According to official data, after Tesla announced a price cut at the beginning of 2023, Tesla announced in May that it would increase the price of its Model S and Model X by 19,000 yuan. In July, Tesla announced that users who buy two new models, Model S or X, can enjoy benefits of 35,000 to 45,000 yuan. In August, Tesla once again announced that its Model Y long-life version and Model Y high-performance version of two high-equipped models ushered in price adjustments, and the starting price after adjustment was 299,900 yuan and 349,900 yuan respectively, both of which were lowered by 14,000 yuan. At the beginning of September, Tesla adjusted the price of its Model S and Model X models at the time of the launch of the new version of Model 3 and lowered the price by 110,000 yuan to 220,000 yuan [6].

Tesla's main target is to set up a sense of urgency for consumers through reverse pricing, while promoting consumption. However, ignoring the impact of the epidemic has led to a decline in people's consumption levels. Secondly, some similar new energy vehicles in China continue to reduce prices, rather than relying on price increases to stimulate consumption, and consumers are more inclined to cheaper products. Therefore, Tesla's strategy briefly promotes consumption, but it cannot occupy the market for a long time.

2.3. Fiere Competition

Taking BYD as an example, BYD is a domestic electric vehicle brand in China. In recent years, BYD's technical level has continuously improved, and its car technology can reach the same level as Tesla's, and domestic cars have received more support in China. Data show that BYD's annual sales in 2023 were 3.024,400, an increase of 61.9%. In terms of overall sales, BYD's new energy vehicle sales in 2023 surpass Tesla. However, when considering only electric vehicle sales, Tesla remains the leader.

In 2023, BYD sold 1,574,800 pure electric models. However, the sales difference between BYD and Tesla in terms of pure electric models is becoming smaller. In 2022, BYD sold approximately 911,000 pure electric vehicles while Tesla sold around 1.31 million, resulting in a gap of roughly 460,000 vehicles. This gap further decreased to about 240,000 vehicles in 2023. Moreover, during the fourth quarter of 2023, BYD surpassed Tesla by selling over 520,000 pure electric models.

Getting through from the financial report, BYD's revenue in the third quarter of 2023 was 162.151 billion yuan, and Tesla's revenue was 23.35 billion US dollars (about 170.689 billion yuan), from the revenue point of view of the two car companies were similar. Nevertheless, Analyze the data of gross profit margin, BYD reached 19.79% in the third quarter of 2023, which has exceeded Tesla for three consecutive quarters. According to the forecast of the China Association of Automobile Manufacturers, the total sales volume of China's auto market will reach 31 million in 2024, of which the sales volume of new energy vehicles will reach 11.5 million, an increase of 20%. Overall sales have risen to 30 million, with Chinese brands becoming the main force [7]. With the continuous internal volume of the domestic market, domestic automobile brands similar to BYD can independently develop major parts and accessories to achieve self-production and self-sale, and effectively control costs, which reduces the competitiveness of Tesla in the Chinese market, Tesla also has to take into account the research and development of other products, so the development speed in the Chinese market slows down.

From the above three parts, we can easily comprehend the factors contributing to Tesla's declining competitiveness in the Chinese market, although limited research has been conducted on this matter. Therefore, I think it is necessary to further study the reasons for the slowing down of Tesla's development in China and put forward reasonable suggestions.

3. Analysis

On the whole, there is still insufficient literature and research on this aspect, and there is a lot to be added, so I think there are still some aspects worth adding. I used SWOT analysis to analyze the reasons for the decline of Tesla's growth in China. SWOT analysis is a comprehensive study of the internal and external environment of enterprise development, which includes four different perspectives and aspects: strengths, weaknesses, opportunities and threats which helps enterprises to clarify their strengths and weaknesses and find market opportunities and existing challenges. Enterprises should leverage their strengths to the fullest extent, enhance and minimize the adverse effects of weaknesses on their own progress, capitalize on market gaps and growth prospects, tactfully address challenges, and be well-prepared to confront risks from all stakeholders.

3.1. Advantages

3.1.1. History issues

Compared with domestic electric vehicle brands such as BYD and Xiaopeng, Tesla has a higher international recognition, and people tend to consider Tesla as their first choice when buying electric vehicles. The brand name of Tesla, derived from the renowned American scientist and inventor Nikola Tesla, establishes a direct association between Tesla cars and the innovative spirit and accomplishments of notable individuals. This deliberate choice aims to create a positive initial impression of Tesla electric vehicles in people's minds [8].

3.1.2. Advanced technology

Compared to its current rivals, Tesla's products hold an absolute dominant position in terms of platform arrangement, information systems, and power systems. In the body structure, Tesla employs a battery pack integrated into the chassis technology while constructing the entire platform using lightweight aluminium alloy materials. This design enables the vehicle to achieve exceptional control with an ultra-low center of gravity and reduced weight. Concerning information systems, Tesla vehicles exhibit remarkable intelligence and integration capabilities, offering advanced features like over-the-air upgrades and autonomous driving functionality. As for the power system, Tesla pioneers dual-motor all-wheel drive technology combined with efficient battery management techniques that result in unparalleled endurance and performance compared to other competitors' offerings.

3.1.3. Superior Service System

The innovative concept of 'official network direct operation' enables a seamless car delivery experience that is effortlessly accessible through the city experience store display and website ordering. Across major cities, numerous sheet metal repair centers are conveniently available to cater to car owners seeking maintenance or minor scratch repairs. Tesla's charging station network is unparalleled, making it challenging for competitors to replicate. Spanning across the entire Chinese mainland, this extensive set of charging facilities empowers Tesla users with worry-free long-distance travel and cross-province endurance [9].

3.2. Disadvantages

3.2.1 Fewer charging facilities

Tesla offers two types of charging facilities, namely supercharging stations and destination charging stations, to cater to the requirements of Tesla owners who wish to embark on long-distance journeys. Supercharging stations are strategically located along major highways in order to meet the travel demands of Tesla users covering extensive distances. Destination charging stations mainly meet the needs of Tesla owners for short trips, and are mainly built in business areas with large passenger flow; Tesla, as a foreign-funded enterprise, currently has a more complete charging layout than Tesla in other new energy vehicle companies in China. However, the data reveals that only a mere 9% of Tesla's existing supercharger stations have undergone the necessary upgrades to comply with the new national standard. It is worth noting that apart from Beijing, Tianjin, Guangdong, Hunan,

Zhejiang and Shanghai, none of the supercharger stations in other provinces and cities across the country have been updated to meet this new requirement. Additional investigation revealed that the proportion of new national standard destination charging stations in Guangdong, Zhejiang, Jiangsu, Sichuan, Beijing, Shanghai and Chongqing amounted to 50%, whereas other provinces and cities only accounted for a mere 4.7% of the newly established national standard charging stations.

Fig. 1 Map of Tesla Supercharger stations in China [10].

According to the distribution map given by Tesla's official website, it is not difficult to see that most of Tesla's supercharging stations are distributed in the developed areas along the southeast coast of China, compared with the small number of charging stations in the northwest inland areas, which need to be popularized.

This indicates that despite the implementation of the new charging method in China, Tesla has already adopted it, but in the new national standard upgrade is far from enough, in the North, Shanghai, Guangzhou and Shenzhen, Jiangsu and Zhejiang, Sichuan, these Tesla electric vehicles ownership areas, the proportion of the new national standard destination charging station is much higher than other parts of China. According to the research, most of Tesla's charging piles are laid out in the southeast coastal areas of China, and the northwest inland areas have not achieved popularity, so the popularity rate needs to be improved.

3.2.2. Low audience level

Based on the statistics provided by the China Business Industry Research Institute, Tesla emerged as the top-selling electric vehicle brand worldwide between January and August 2017, with a remarkable sales figure of 59,263 units. Followed by BYD, with sales of 57,288; BMW, with sales of 55,683; Baic New Energy, with sales of 44,227; Nissan, 36,728 units sold; Toyota, with sales of 35,162; Chevrolet, with sales of 31,699; Zhitou, sales of 27,532 units; Renault, 26,519 vehicles sold; Volkswagen, 23,226 units sold. However, the audience of the Tesla brand in China is not large, and the brand is still known by high-end people and car enthusiasts [11].

According to the data provided by the China Passenger Car Market Information Association, Tesla's electric vehicle sales in China for 2017 amounted to 17,670 units. This figure represents approximately 2.3% of the total new energy vehicle sales in China for that year, which reached 777,000 units. In comparison, BYD achieved a significant market share with their new energy vehicles totaling 113,669 units sold in China during the same period, accounting for about 14.6%. China's new energy vehicles in China's car sales accounted for a much lower proportion than traditional cars, and Tesla in China's new energy vehicle sales accounted for only 2.3%, far lower than China's top ten new energy car companies. This indicates that despite Tesla's significant global brand impact, it has yet to penetrate the mainstream market in China, so Tesla's mass market recognition in China is low [12].

3.2.3. Fewer car types

Compared with BYD, Tesla, only Model 3, Model Y, Model S, and Model X, several well-known models can be chosen by consumers, but BYD has more than 60 models, including cars, off-road vehicles, buses and other types can be chosen by consumers.

Table 1. A price comparison of similar models from Tesla and BYD [13].

Tesla model	price
Model 3	245.9-285.9 thousand
Model Y	258.9-362.9 thousand
Model S	698.9-828.9 thousand
Model X	738.9-838.9 thousand
BYD model	price
Qin	64.9-81.9 thousand
Song	69.8-149.9 thousand
Han	169.8-299.8 thousand
Tang	129.9-169.9 thousand

According to the official data comparison, the price of similar models, BYD is also cheaper and easier to attract consumers. The disadvantages of Tesla cars are not only these but a few typical examples are also listed to illustrate.

3.3. Opportunity

From the policy perspective, with the gradual improvement of green environmental protection awareness, the Chinese government has also formulated a series of policies for new energy vehicles. In April 2015, four ministries and commissions jointly issued the Notice on the Financial Support Policy for the Promotion and Application of New Energy Vehicles from 2016 to 2020 [14]. Starting from 2016 until 2020, the government will provide incentives for the acquisition of new energy vehicles across the country, with the aim of encouraging their widespread adoption and utilization. Taking into account factors such as production costs, scale effects, and technological progress, the Chinese government has made dynamic adjustments to the purchase subsidy policy for new energy vehicles, insisting on supporting the best and strengthening the strong. The timely implementation of the purchase subsidy policy and its consistent provision of support have effectively conveyed the government's unwavering commitment to fostering the growth of the new energy automobile industry at a societal level. This has successfully incentivized industry players to invest in new energy vehicles, facilitating the continuous accumulation of social resources. Moreover, it has mitigated market failure risks and expedited China's progress in developing its new energy automobile sector. At the same time, it will improve Tesla's advantages as a new energy vehicle and increase its opportunities in the Chinese market [15].

In addition, people's demand for new energy vehicles has increased. With the beginning of 2024, most new energy vehicles choose to reduce prices to compete with oil vehicles, so as to seize the market, which makes people pay more attention to the market share of new energy vehicles. Secondly, many new energy vehicles have sufficient technological levels, similar to automatic cruise, driverless and other technologies. Compared with new energy vehicles in the domestic market, Tesla has a higher technical level, and Tesla's other technology products are also well-known at home and abroad. Therefore, for Tesla's new energy vehicles, there are still great opportunities in the Chinese domestic market, and Tesla needs more innovation to seize the market.

3.4. Challenges

Tesla's development in China not only has many opportunities but also some challenges. To begin with, the intense competition within China's domestic market poses significant challenges, further exacerbated by the emergence of several local brands that have heightened the complexity of market

rivalry. In the Chinese market, Tesla faces competition not only from domestic car brands but also from imported foreign car brands. In comparison to Tesla vehicles, China's domestically produced new energy vehicles offer a more competitive pricing advantage, while foreign brand cars tend to focus on the high-end segment of the Chinese market. These car brands have a longer history of development and enjoy higher levels of consumer recognition.

For a considerable duration, BYD has been Tesla's primary rival in the market for new energy vehicles, leading to intense competition between these two prominent car brands on a global scale. In recent times, BYD had maintained a relatively dominant position in terms of new energy vehicle sales until 2019 when Tesla surpassed them with sales reaching 367,500 units compared to BYD's 229,500 units. Furthermore, emerging players like Weilai, Ideal, Xiaopeng and other manufacturers of new power automobiles have also entered the scene. The combined onslaught from traditional independent brands and innovative internet-based forces has significantly challenged Tesla [16].

On the surface, the purchase subsidy policy is conducive to Tesla's domestic sales in China, but in fact, the recently introduced subsidy policy is increasingly emphasizing the stability and durability of batteries in renewable energy vehicles, with a focus on the technical indicators of new energy vehicles. As these subsidy policies gradually decrease, the competitive edge enjoyed by Chinese domestic auto manufacturers is slowly diminishing. Consequently, these policy adjustments will encourage domestic auto manufacturers to place greater emphasis on researching and developing innovative battery technologies, thereby driving advancements in China's overall technical capabilities within the new energy automobile industry, and it is possible that through the incentive of government policies, some Chinese domestic new energy automobile brands exceed the technological level of Tesla. The advancement of competitors' technical expertise within the same sector poses a potential challenge to Tesla's technological dominance and may hinder its future progress.

On the other hand, with the deterioration of Sino-US relations in the past two years and the start of the Sino-US trade war, Tesla's sales and exports as an American brand in China will also be restricted by some policies, followed by the decline in the degree of public support for Tesla, people will choose to buy more domestic cars rather than imported cars in the United States.

4. Conclusion

From the above analysis, we can see that although Tesla faces certain challenges, its marketing strategy in China is still worth learning from. After successfully penetrating the Chinese market, Tesla has implemented a range of measures such as price reductions and adjustments to product configurations. These initiatives have not only enhanced the competitiveness of Tesla's offerings in China but also posed significant challenges to the domestic supply chain for new energy vehicles. The new energy automobile industry holds strategic importance in China, playing a vital role in ensuring energy security and mitigating pollution emissions. Without a doubt, Tesla's entry into the Chinese market will exert a powerful catfish effect, propelling forward the transformation and development of China's new energy automobile industry while bolstering the overall competitiveness of domestic enterprises operating within this sector.

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