The Impact of Trade Friction on the Electric Vehicle Industry in China and the United States

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Abstract: Against intensified competition between China and the United States, the electric vehicle industry faces unprecedented challenges and opportunities. Relying on strong policy support and huge market size, China rapidly rises to become the world's largest electric vehicle market, with representative companies such as BYD and NIO emerging. However, with the gradual decline of subsidy policies, these companies need to pay more attention to improving product quality and enhancing market competitiveness. At the same time, the United States is in a leading position in electric vehicle technology innovation, and companies such as Tesla have promoted the development of the industry. However, the Sino-US trade friction has brought high tariff barriers to China's electric vehicle exports, making Chinese and American companies face pressure in the competition. In the future, the competition between the Chinese and American electric vehicle industries will continue to evolve, and the dynamic changes in policies, technologies, and market development between the two sides will affect the development of the sector. Companies need to flexibly respond to policy changes, strengthen technological innovation, actively explore emerging markets, and improve the security of the supply chain to achieve sustainable growth.

1 INTRODUCTION

In recent decades, China has achieved rapid economic growth by relying on its open economy and foreign trade and has become the world's second-largest economy, surpassing Japan. The expansion of the U.S. trade deficit with China has exacerbated tensions between the world's two largest economies (Sukar & Ahmed, 2019). Behind this phenomenon, there are multi-dimensional motivations, among which competition in the technology field is particularly significant, especially in high-tech sectors such as semiconductors and artificial intelligence. Both China and the United States want to gain an advantage in the global technological competition, which has led to sanctions and restrictions on each other. In addition, geopolitical factors cannot be ignored. As China's influence on the international stage increases, the United States feels its status and potential threats and then takes a series of measures to contain China's rise.

As the world pays more attention to environmental protection and sustainable development, the electric vehicle industry has quickly become an important future industry. China and the United States have important market shares and technological competitiveness in this field, and their trade has gradually become the focus of the trade relationship between the two countries. In the Sino-US trade relationship, the electric vehicle industry has become increasingly prominent.

China is the world's largest electric vehicle market, and the government has introduced a large number of policies to support the development of electric vehicles, including subsidy policies, tax incentives, and infrastructure construction. Chinese electric vehicle companies such as BYD, NIO, and Xpeng have risen rapidly and become important competitors in the global electric vehicle industry (Danilovic, M. et al. 2021). China not only dominates the domestic market but also excels in the export of electric vehicles, especially to Europe and other developing countries. The United States is a pioneer in global electric vehicle technology innovation. As the world's most valuable electric vehicle company, Tesla has promoted the development of global electric vehicle technology. The US government has also gradually increased its support for the electric vehicle industry. The US market started slowly with the popularization of electric vehicles, but with the

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rise of companies such as Tesla, the acceptance of electric vehicles in the US market has gradually increased.

The electric vehicle industry has not been completely immune to the Sino-US trade friction. The United States imposes high tariffs on Chinese-made electric vehicles and related parts, which increases the export costs of Chinese electric vehicle manufacturers and affects their competitiveness in the US market. Conversely, China has also imposed certain restrictions or increased tariffs on electric vehicles and technology products exported from the United States (Belton, et al. 2020). With the development of Chinese domestic electric vehicle companies, their dependence on the US market has gradually decreased, and they have instead reduced their dependence on the US market by actively exploring other international markets.

This article aims to analyze the impact of trade frictions on the Sino-US electric vehicle industry, propose solutions to the market turmoil caused by Sino-US frictions, and make development suggestions for Chinese and American electric vehicle companies.

2 ANALYSIS

Since the outbreak of the Sino-US trade friction in 2018, it has become an important issue in the global economy. With the rapid development of the electric vehicle industry, the electric vehicle industry has also become an important part of the Sino-U.S. trade friction that cannot be ignored.

2.1 Tariff and Policy Impact

Since 2018, trade frictions have led to the United States imposing high tariffs on Chinese electric vehicles and parts. By 2019, the tariff rate had reached 25%. This move has caused Chinese manufacturers such as BYD, NIO, and Xiaopeng to increase their costs in the United States, lose their price advantage, and find it difficult to build a stable sales network, which has impacted their market share. China has retaliated against American products by imposing tariffs on American electric vehicles and key parts, raising the costs of American companies, such as Tesla, which has affected its sales in China. For this reason, American companies such as Tesla have set up factories in China, such as the Shanghai "Super Factory", to reduce tariff costs and enjoy policy benefits (Yu, J, 2023).

Under the pressure of external trade frictions, China has introduced a series of support policies such as fiscal subsidies, tax exemptions, and infrastructure construction to promote the development of the electric vehicle industry. In particular, between 2015 and 2020, thanks to government support, China's electric vehicle market expanded rapidly. After the Biden administration came to power, the United States supported the electric vehicle industry, put forward the goal of "green electric vehicles", enhanced the independence of its industry, and introduced preferential policies such as subsidies, battery and charging facility investment to help the recovery of the US electric vehicle industry. Local companies such as Tesla have expanded their market share after receiving subsidies (Sherilyn. et al. 2021).

2.2 Technical Cooperation and Market Competition

Battery technology is the core of electric vehicles. The development of lithium batteries and solid-state batteries affects vehicle range, charging speed, and cost. As the world's largest battery manufacturer, China's CATL occupies an important position in the field of battery technology. Tesla in the United States has significant advantages in both battery technology and autonomous driving technology. The competition between enterprises of the two countries around these core technologies has greatly promoted the pace of technological innovation.

Tesla in the United States has achieved remarkable results in the field of autonomous driving, and its system leads the world (Chai, Z. et al. 2021). However, Chinese companies such as NIO, Xpeng, and Ideal are also actively investing, and some have launched autonomous driving systems based on LIDAR technology. The competition between the two parties in this field is fierce, with rapid technology iteration and high corporate investment in R&D, which has effectively promoted the development of the overall technology of electric vehicles.

In terms of cooperation, Tesla and China are becoming increasingly close. The production base established by Tesla in Shanghai has not only broken through the tariff barriers but also enjoyed preferential policy support. It has joined hands with CATL to consolidate its advantages in battery technology and has also established cooperation with local governments in China and upstream and downstream enterprises in the industrial chain to jointly promote technological innovation in electric vehicles.

However, in the context of trade frictions, technology transfer has become a sensitive issue. The

United States restricts high-tech exports to China, especially key electric vehicles and autonomous driving technologies. Although China and the United States have cooperation in some areas, as trade frictions intensify, technological barriers continue to rise, and the transfer and cooperation of some technologies are suppressed, limiting the space for cooperation in the electric vehicle industry. This complex situation of technological cooperation and competition has profoundly affected the development direction of the electric vehicle industry in China and the United States. It has not only promoted the acceleration of innovation in their respective areas of strength but also hindered technological exchanges and industrial collaboration to a certain extent, bringing many variables to the industry's globalization process (Cerruti, et al. 2019).

2.3 Changes in the Industrial Chain and Supply Chain

On the Chinese side, the intensification of trade frictions has promoted the vigorous development of the battery industry, making China's position in the global electric vehicle industry chain more prominent. China has a dominant position in the production of key materials such as lithium batteries, cobalt, and nickel (Sun, X. et al. 2021), and has supported related enterprises through policies to ensure the global competitiveness of production, reduce dependence on external supply, and consolidate its dominant position in key links in the industry chain.

In the United States, the electric vehicle industry is moving towards autonomy, focusing on areas such as chips, batteries, and rare earth materials. Manufacturers such as Tesla are promoting localized production and strengthening collaboration with domestic suppliers, aiming to reduce supply chain dependence on China and other countries, reduce the impact of external risks on domestic industries, and reshape their layout in the global electric vehicle industry supply chain.

The electric vehicle industry chain is highly dependent on the global supply chain, especially in the fields of chips, sensors, and autonomous driving hardware (Bathla, G. et al. 2022). However, the escalation of Sino-U.S. trade frictions has dealt a heavy blow to the stability of the supply chain. For example, Chinese companies are restricted in their access to American chips and software and have to look for alternatives or increase their independent research and development efforts to ensure their production operations. To buffer the impact of trade frictions on the supply chain, many companies are actively exploring diversified paths. Chinese electric vehicle manufacturers are turning their attention to suppliers in Southeast Asia, Europe, and other places to reduce their dependence on the United States and Japan. American companies such as Tesla have increased their dependence on local suppliers and accelerated the process of autonomy in the American electric vehicle industry to cope with the turbulent changes in the global supply chain structure and ensure the sustainable development of the industry.

3 RESPONSE STRATEGIES

The electric vehicle industry faces complex challenges and opportunities amid intensifying competition between China and the United States. As the world's largest economy, the competition between China and the United States involves multiple dimensions, including trade policies, market access, technological innovation, brand building, and market expansion. The electric vehicle industry has become a key area of future transportation and an important battlefield for competition between the two countries. To gain a foothold in this competition, major companies need to formulate effective response strategies to enhance their market competitiveness.

3.1 Supply Chain Diversification

The stability and flexibility of the supply chain are crucial to the survival of enterprises. The characteristics of the supply chains in China and the United States are different. China's electric vehicle industry relies on a mature manufacturing base and a sound supply chain to quickly respond to market demand and reduce costs (Rajaeifar, MA et al. 2022). However, over-reliance on a single market exposes companies to policy risks, especially when international trade is unstable. American companies have advantages in technology research and development and innovation, especially software and autonomous driving technology, but their production capacity is weak and they need to rely on external supply chains.

To cope with supply chain risks, companies should reduce their dependence on a single country, actively seek suppliers from other countries, and establish production bases in Mexico or Southeast Asia to enhance flexibility and resilience. At the same time, they should increase efforts to develop local suppliers and improve supply chain security. The introduction of advanced management technologies

such as blockchain and the Internet of Things can improve transparency and efficiency, help companies better manage risks, and reduce potential losses (Viriyasitavat, W. et al. 2019).

3.2 Technological Innovation

Technological innovation is the core of competition in the electric vehicle industry. China and the United States have gradually increased their R&D investment in battery technology, autonomous driving, and intelligent networking. The Chinese government supports the electric vehicle industry and encourages companies such as CATL to take the lead in battery technology (Fichtner, M. 2022). At the same time, Chinese start-ups are active and promote technological progress. The United States has advantages in software and autonomous driving. Tesla occupies an important position in the market but faces challenges from traditional car companies and emerging electric vehicle companies.

Companies should increase investment in technology research and development, especially in the fields of batteries and autonomous driving, cooperate with universities and research institutions, form technology alliances, and accelerate innovation. At the same time, they should enhance their competitiveness by acquiring start-ups, attach importance to intellectual property protection, and ensure that technological achievements are not imitated, so as to maintain their market advantages.

3.3 Market Development

With the rapid growth of the global electric vehicle market, market development has become an important goal for corporate development. The market characteristics and consumer preferences of China and the United States are different, and companies need to formulate corresponding strategies. The Chinese market has strong demand, and policy support has increased consumer acceptance of electric vehicles, and sales have ranked first in the world for many years. However, competition is fierce, and emerging brands are emerging in an endless stream. The US market is relatively mature, and Tesla is dominant, but it also faces challenges from traditional car companies. Consumers pay more attention to performance, brand reputation, and after-sales service (Ingram, N.2018).

Companies should actively explore emerging markets such as Europe and Southeast Asia to diversify risks. When entering new markets, they should adjust their products and marketing strategies according to local needs and policies, such as launching models that comply with environmental regulations in Europe. At the same time, they should use digital means to interact with consumers, and accurately position and personalize marketing to better meet consumer expectations.

3.4 Policy Response

The policy environment is crucial to the development of the electric vehicle industry. The policy differences between China and the United States directly affect the strategic choices of enterprises. The Chinese government promotes the development of electric vehicles through subsidies and policy support. The market prospects are broad, but policy changes may bring uncertainty. Enterprises need to pay attention to dynamics. As subsidies gradually decline, companies need to pay more attention to product quality and competitiveness.

The U.S. policy environment is complex, with significant differences among states. Although federal support has increased, local policies may lead to different market access thresholds. Companies need to be flexible and adjust their strategies to adapt to changes. Establish a dedicated policy research team to keep abreast of developments and look for policy support opportunities. At the same time, people actively participate in industry associations, influence policy formulation, create a favorable market environment, strengthen communication with the government, and participate in policy consultation and pilot projects to obtain support and market opportunities.

Competition in the electric vehicle industry between China and the United States will continue to evolve, and there may be more policy adjustments, technological breakthroughs, and market development in the future. China has unique advantages in policy support and market size, while the United States has certain advantages in innovation and technological leadership. Competition in the electric vehicle industry between China and the United States will continue to evolve, and companies need to maintain flexibility and innovation capabilities to remain invincible in the fierce market. Only by working together from multiple dimensions such as technology, market, and policy can companies occupy a place in the global electric vehicle industry.

4 CONCLUSION

First of all, as the above shows, with the growing development of China and the United States, frictions and disputes between China and the United States continue. In recent years, the electric vehicle industry has gradually occupied an important position in the market. Therefore, it is very important to study the electric vehicle industry in the Sino-US trade friction.

Secondly, when studying the factors that affect the electric vehicle industry due to Sino-US trade frictions, it can find that tariff policies, cooperation and competition, and industrial chain and supply chain are three important factors. Whether the country supports the formulation of policies determines the vitality of the electric vehicle industry. Tariff policies affect the transaction status of electric vehicles under international trade. Cooperation and competition promote and restrict the technological progress of enterprises. Whether the industrial chain and supply chain is complete determines whether the lifeline of the enterprise will be strangled during its development. Therefore, enterprises need to flexibly respond to policy changes, increase technological innovation, and actively explore emerging markets to diversify risks.

Finally, in the future, the competition between China and the United States in the electric vehicle industry will continue to evolve. As the competition between China and the United States in the field of electric vehicles continues to intensify, there may be more policy adjustments, technological breakthroughs, and market development in the future. China has unique advantages in policy support and market size, while the United States has certain advantages in innovation and technological leadership. As an important part of the global green transportation revolution, electric vehicles may become a key area of cooperation and competition between China and the United States in the future.

REFERENCES

Bathla, G., Bhadane, K., Singh, R. K., et al. 2022. Autonomous vehicles and intelligent automation: Applications, challenges, and opportunities. Mobile Information Systems (1): 7632892.

Belton, K. B., Graham, J., Xia, S. 2020. Made in China 2025 and the limitations of US trade policy. Available at SSRN 3664347.

Chai, Z., Nie, T., Becker, J. 2021. Autonomous driving changes the future. Springer.

The impact of US-China trade tensions. 2019. IMF. Retrieved from https://blogs.imf.org/2019/05/23/the-impact-of-us-china-trade-tensions/

Danilovic, M., Liu, J. L., Müllern, T., Nåbo, A., Almestrand Linné, P. 2021. Exploring battery-swapping for electric vehicles in China 1.

Fichtner, M. 2022. Recent research and progress in batteries for electric vehicles. Batteries & Supercaps 5(2): e202100224.

Hayashida, S., Croix, S.L., Coffman, M. 2021. Understanding changes in electric vehicle policies in the U.S. states, 2010-2018. Transport Policy (2).

Ingram, N. 2018. Tesla Motors: A Potentially Disruptive Force in a Mature Industry. International Journal of Management and Applied Research, 5(1), 8-21.

Rajaeifar, M. A., Ghadimi, P., Raugei, M., et al. 2022. Challenges and recent developments in supply and value chains of electric vehicle batteries: A sustainability perspective. Resources, Conservation and Recycling 180: 106144.

Sukar, A., Ahmed, S. 2019. Rise of trade protectionism: the case of US-Sino trade war. Transnational Corporations Review 11(4): 279‑289.

Sun, X., Liu, Z., Zhao, F., Hao, H. 2021. Global competition in the lithium-ion battery supply chain: a novel perspective for criticality analysis. Environmental Science Technology 55(18): 12180-12190.

Viriyasitavat, W., Da Xu, L., Bi, Z., et al. 2019. Blockchain and Internet of Things for modern business process in digital economy−the state of the art. IEEE transactions on computational social systems 6(6): 1420-1432.

Yu, J. 2023. Research on the link between RMB exchange rate and Tesla's stock price: a long-term perspective. In international conference on economic management and green development, Singapore: Springer Nature Singapore. 1893-1902.