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Decoupling from China: A Case Study of Electric Vehicles and Implications for Europe and the US

Zsófia NGUYEN[1]

[1]PhD Candidate in Economic, University of Sopron University degree (dr. univ.) 2017

KEYWORDS

- Electric Vehicles
- Globalization
- Industrial Policy

ABSTRACT

The electric vehicle sector has emerged as a critical component in the global shift towards sustainable mobility. However, the industry's reliance on Chinese supply chains and manufacturing capabilities presents a significant concern for many countries, particularly given the ongoing geopolitical tensions with increased tariffs. These tariffs represent protectionism, potentially causing inefficiencies and higher consumer costs, leading to significant delays in the reduction of carbon emissions, which many developed Western nations have committed themselves to. As a result, the concept of decoupling from China has gained traction, presenting both opportunities and challenges. This paper explores the feasibility and implications of decoupling from China in the EV sector. The paper found that if a complete decoupling from China in the EV sector were to happen, it would require significant investment, lead to increased costs, and potentially disrupt supply chains. Partial decoupling, maintaining some economic ties while investing in domestic capabilities, could mitigate risks. The paper suggests a balanced approach, collaborative initiatives between China, US and EU could be more effective.

JEL-codes: L62, H23, R41, Q58

Introduction

In the last decade, electric vehicles (EV) have become a critical transformation and innovation of the global automotive industry, with China emerging as a dominant player in the market, accounting for 60% of consumption and 45% of production in 2023. It is also the primary producer of lithium batteries, the main component in EVs, with 65-80% of global production (IEA, 2024). It should be noted that it is not only Chinese EV brands (BYD, Great Wall, SAIC, BAIC, Changan, Chery, Geely, XPeng, NIO) that produce EVs in China; many Western brands (Tesla, Ford, GM, BMW, VW, Mercedes,

[1] E-mail: zsofia.trang.nguyen@phd.uni-sopron.hu
MTMT: 10082053 | ORCID: 0009-0007-9533-3690

Audi, Renault, Jaguar Land Rover) also have EV plants within China, producing for the Chinese domestic market, but also for export. Internationalization has become a crucial aspect for all EV manufacturers in China, targeting key external consumer markets. So far, Chinese EVs have primarily entered international markets through exports. The growth in EV exports has played a significant role in reversing China's automotive trade balance; since mid-2022, vehicle exports have consistently outperformed imports. This trend was further accelerated by the export of Chinese-produced vehicles to Russia, particularly in light of the retreat of Western brands from this market following the invasion of Ukraine (Oliveira, 2024).

The primary destination market for Chinese EVs export is Europe, followed closely by Asia. In contrast, there is minimal penetration in the North American and Latin American markets, although growth is accelerating in Brazil (Oliveira, 2024). Recently, the EU imposed a provisional anti-subsidy tariff of up to 37.6% on EVs imported from China after an anti-subsidy investigation launched by the European Commission in October 2023 without a petition by domestic EV producers. Furthermore, Chinese EV brands are generally hesitant to export to the U.S. due to a 27.5% tariff on imported automobiles, which is also expected to rise to 100% through the new trade restriction (Zhou & Gao, 2024). Additionally, the U.S. government has signaled its intention to decouple from China, emphasizing this goal over efforts to reduce carbon dioxide emissions and other gases that contribute to global warming (Tobita & Hotta, 2023). Consequently, the Chinese EV industry faces a wave of unilateral trade restrictions as US and EU policymakers are set to impose further tariffs on Chinese EVs. From this trend, a crucial question arises: is it possible for Western automakers to decouple from China's supply chain in the EV sector?

The notion of decoupling from China's supply chain has gained traction in recent years, driven by concerns over trade tensions, intellectual property protection, and geopolitical risks (Farrell & Newman, 2020). However, the reality of decoupling is far more complicated, particularly in the EV sector where China has established a significant lead in terms of technological innovation, efficient production, at a low-cost base. This paper aims to investigate the implications of decoupling from China's supply chain in the EV sector, with a focus on the potential impact on US and EU policymakers. Specifically, it will examine the challenges and opportunities associated with diversifying supply chains outside of China, the potential consequences of imposing tariffs on Chinese EVs, the strategies that Western automakers can

adopt to remain competitive, and how the EU and the US can effectively balance their trade relationship with China while promoting its strategic interests, reducing dependence, and increasing competitiveness in the EV race.

The Emergence of China's Electric Vehicle Industry

In the early 2000s, China's car industry was struggling, focusing mainly on traditional internal combustion engine vehicles (ICE) without any domestic brands capable of competing with foreign automakers and potentially leading this domain. China recognized that it would never surpass the automakers from the US, Germany, and Japan in terms of innovation for ICE. Additionally, research on hybrid vehicles, where the batteries initially played a secondary role compared to the gasoline engine, was already pioneered by Japan. The Chinese government turned its attention to EVs as a new priority. This shift also aimed to address several issues, including severe air pollution and reliance on imported oil, while also aiding economic recovery post-2008 crisis. EV technology became a focal point in China's 10th Five-Year Plan (FYP) period 2001-2005, especially after Wan Gang – an automotive engineer with EV expertise who worked for Audi in Germany –, became the minister of science and technology in 2007. To encourage the growth of the EV industry, the government implemented supportive measures, such as offering $29 billion in financial subsidies to automakers from 2009 to 2022, integrating EVs into public transportation, waiving license plate restrictions for EVs in cities like Beijing, and providing local government support to companies like BYD. The government support also included extending subsidies to foreign firms, such as Tesla, to strengthen the EV ecosystem. Lastly, it is important to mention that China has huge investments in building charging infrastructure across the country, making it more convenient for EV owners to recharge their vehicles and combat initial resistance to change from ICEs commonly referred as "range anxiety" (Yang, 2023).

With substantial government support, China's EV industry transitioned from the exploration stage to the demonstration stage during the 11th FYP (2006–2010). In this period, 2,600 plug-in EVs were put into operation, including 970 battery electric cars (BEV), 350 plug-in hybrid electric cars (HEV), 730 battery electric buses, 350 plug-in hybrid electric buses, and 200 battery electric special vehicles. During the 12th FYP (2011–2015), the Chi-

nese New Energy Vehicle (NEV) industry entered the market stage, progressing from the demonstration phase, with 494,200 plug-in EVs put into operation (Du et al., 2017). During the 13th FYP (2016–2020), the entire industrial chain of the EV industry was established and upgraded at the national level. In line with the expansion of the sector, financial subsidies from the government gradually declined while the technical entry barriers for the EV industry increased. Strong interventions were implemented to guide and promote the sustainable development of EVs, particularly focusing on technological innovation and improving energy efficiency (Wu et al., 2021).

As a result of these policies and investments, China has become the world's largest market for EVs, accounting for 60% of global EV sales in 2023. Most of the EVs sold in China are produced domestically. Additionally, China is the leading global producer of lithium batteries with 60% to 80% for cathode productions, which are essential components of EVs (IEA, 2024). With the battery typically accounting for about 40% of the cost of a new EV, China's focus on developing affordable technology in this field is now paying major dividends. Many Western EV makers initially favored lithium nickel manganese cobalt (NMC) batteries, which offer a longer range and higher performance.

In contrast, Chinese companies have prioritized lithium iron phosphate (LFP) technology, which is cheaper and more reliable. By focusing on improving LFP batteries, the Chinese firm CATL has become the leading global EV battery manufacturer, with control of more than a third of the global market. China's strength in battery production is bolstered by the good access it has secured to the raw materials used because of a long-term strategy of buying stakes in key mining companies for minerals such as lithium. It also controls the majority of the refinery capacity in the world when it comes to critical components. Factors such as these are contributing to the growing global dominance of China in EV batteries (Wang, 2024). The growth in the sector has not only provided sustained growth for China's EV industry but also positioned China as a leader in climate policy (Yang, 2023). These policies are part of the 14th FYP (2021-2025), which promotes collaboration between EV and battery manufacturers to integrate NEV production with recycling processes and to manage the entire lifecycle of reused EV batteries, ensuring quality and responsible environmental disposal with the government offering incentives such as tax exemptions and loans (Zhou et al., 2023).

Current State of China and the West EV Industry

In recent years, the demand for EVs is rising as competition intensifies, leading to a decrease in price compared to non-electric vehicles, making them more affordable and accessible to the public. Notably, the second-hand EV market is also expanding, with prices falling quickly and becoming competitive with combustion engine equivalents. According to Global EV Outlook 2024 from the International Energy Agency (IEA, 2024), in 2023, around 14 million EVs were sold globally, with most of the sales concentrated in China (60%), Europe (25%), and the United States (10%). In contrast, these markets accounted for around 65% of total car sales worldwide, showing that sales of EVs remain more geographically concentrated than those of conventional ones. Although EV sales in emerging economies have been slower than in major markets, growth accelerated in 2023, with Vietnam seeing around 15% of cars sold as electric and Thailand at 10%. The same study from IEA also states that the global share of EV sales is projected to increase to 35% by 2030, up from less than 25% in previous forecasts. China is expected to remain the largest market for EVs, followed by the US and the EU, which are anticipated to double their market shares and maintain their current positions. As China leverages its dominance in EV and battery production to foster a robust domestic EV industry. Chinese companies like CATL, BYD, and SAIC Motor are key players in the global EV market (Yang, 2023). From 2018 to 2023, exports of Chinese EVs experienced rapid growth, with 1,016% in both quantity and value. In 2023 alone, China's total exports of EVs increased by 70%, reaching a value of $34.1 billion. The quality of these exports is also improving, as evidenced by higher unit prices and an increasing proportion of exports going to high-income countries such as the UK, or the Gulf States of Saudi Arabia, the UAE and Qatar. This growth has been fueled by a relaxation of joint venture requirements for EV manufacturers imposed by the Chinese government, as well as the development of higher-quality EVs by domestic manufacturers. However, Chinese EV exports to the United States did not see significant increases during this period due to high tariffs of 27.5% on automobiles imported from China (Coffin et al., 2024). The majority of EVs exported from China are destined for Western Europe and the UK due to high demand in the region, high per capita income, high local EV prices, low European customs tariffs (Oliveira, 2024). There are also substantial government and manufacturer subsidies regardless of its origin, in an attempt to reduce emissions and support EVs adoptions as seen in

many EU countries such as Germany provides up to €6,750 via its Umweltbonus scheme (Morrison et al., 2023), Spain's MOVES III program extends to €400 million to support EV adoption and charging installations and other member states offer purchase incentives, such as tax breaks and reduced toll fees, to make EVs more affordable (European Commission, 2025).

The second largest share of China's EV market is held by a foreign firm – the US-based Tesla, which accounted for 7.8% of the market last year. Western auto firms have historically operated in China through joint ventures, but since 2019, Tesla has had its own wholly-owned factory in Shanghai, which received national and local government support and now makes 150,000 cars a year. In the Chinese domestic market, Tesla primarily targets the high-end segment, while BYD's main focus is on more affordable cars such as the Seagull, billed as the world's cheapest electric car. Nonetheless, Tesla is in increasingly fierce competition with Chinese firms both in the international and local Chinese markets. In 2023, Tesla significantly cut prices for some of its Chinese models, as Geely successfully launched their premium brand called Zeeker in direct competition to Tesla's most popular Model 3 and Model Y products (Wang, 2024).

To understand the competitiveness of Chinese EV brands, a recent report by Rhodium Group (2024) gives the example of BYD's Seal U model that sells for €21,769 in China and €41,990 in the EU. Not only are Chinese automakers rapidly gaining shares of the European EV market (especially in the lower-priced segments), but they are making higher profits on their European sales. (Bukowski, 2024).

Table 1. Volkswagen and BYD model comparison in Germany and China (Price in EUR)

OEM	Model	Price in Germany	Price in China	German price premium relative to China	Battery kWh	Horsepower
Volkswagen	ID.4	46,335	31,011	49.4%	77	204
BYD	Seal U Comfort	41,990	21,769	92.9%	72	218
Volkswagen	ID.3	32,975	21,011	56.9%	58 (CN: 52.8)	204 (CN:170)
BYD	Atto 3 Comfort	37,990	17,923	112.0%	60.5	204

Source: Rhodium Group, 2024

Factors Promoting the Decoupling of EV

The aforementioned increases in tariffs leveraged against China-made EVs is part of a broader concern by the US and its European allies regarding China's strategic industrial policies. In this context, both the EU and the US continue to reinforce expectations for EV legislation to align with their 2030 strategy and simultaneously encourage adding value and creating jobs across EV supply chains in their economies. The difference in US and European approaches to Chinese EVs reveals deep strategic divisions. The US is concerned about maintaining its technological edge and protecting domestic industries. It has embraced protectionism and tariffs to counter China's rise. EU countries on the other hand remains cautious, recognizing the risks of alienating a major economic partner (Bukowski, 2024). In May 2024, the US increased tariffs on Chinese-made EVs from 25% to 100%; this follows its longstanding concern about China's unfair trade practices (Zhou & Gao, 2024). Additionally, the US Defense Department has added Chinese battery manufacturer CATL to a list of companies it claims work with China's military, further escalating tensions between the US and China. CATL responded by stating that it is not engaged in any military-related activities. While the designation does not involve an immediate ban on sales, it presents a significant a blow to the reputations of affected companies and signals a stark warning to US entities and firms about the risks of conducting business with

them. It could also add pressure on the US Treasury Department to sanction the companies. The purpose of the Chinese Military Companies (CMC) list is to communicate the Defense Department's opinions, which may guide other government departments. The most severe consequence for companies on the CMC list is a potential ban on US investments, but the final decision will rest with the reelected President Trump and his administration (Reuters, 2025). Therefore, it remains uncertain whether a new phase of stricter measures against China will emerge, particularly since Trump is historically known for initiating the trade war with China and increasing tariffs on goods and banning Huawei from the 5G network over national security concerns (Nguyen, 2022).

In line with the US, Canada has increased its import tariff on Chinese EVs from 6.1% to 100%, citing issues related to Chinese industrial policies and subsidies that lead to overcapacity and unfair competition. In July 2024, the EU imposed a provisional anti-subsidy tariff of up to 37.6% on EVs imported from China, following an anti-subsidy investigation initiated by the European Commission in October 2023, without any petition from domestic EV producers (Zhou & Gao, 2024). This decision has revealed a division among EU countries. The French government has argued for high tariffs, seeking to shield its robust but struggling domestic car industry from cheap Chinese imports. Conversely, German automakers, with large market shares in China and longstanding partnerships with Chinese firms, worry about a tit-for-tat retaliation. China has signaled its willingness to retaliate by threatening to raise tariffs on high performance ICE vehicles from 15% to 25%, a direct threat to BMW, Porsche and Mercedes' luxury vehicles. Other EU nations are similarly divided. BYD is already building factories in Hungary and Spain as part of their strategy of localizing production within the EU and thus circumventing the import tariffs (Bukowski, 2024). Furthermore, China has also filed a dispute against the EU's tariff at the World Trade Organization (Zhou & Gao, 2024). It is not clear the effect that such an increase will have on European consumers demand for China-produced EVs, but it is likely to slow down the fast penetration they were having on the wealthier Western European markets (Oliveira, 2024).

Discussion on Potential Consequences of Decoupling and Implications for Europe and the US

Comparing the US and EU approach towards China reflects the wide range of possible outcome in response to decoupling from China. The stark contrast between the 2 largest economies in process and outcomes underlines the enormous impact of the political system. The US, and EU have a complex relationship with China regarding EVs production, despite their differences, the US and EU share a common concern about China's overwhelming dominance in the EV and broader green technology space. The US has taken an aggressively protectionist, with blanket tariffs on Chinese EVs and related materials, reflecting a dual focus on protecting domestic industries and decoupling from China. In contrast, the EU has adopted a more calibrated approach, imposing provisional tariffs of 37.6% on Chinese EV imports following an anti-subsidy investigation. In both markets, demographic, social, and psychological influences shape consumer perceptions of EVs, contributing to significant heterogeneity in consumer preference. The differing tariffs and strategies of the US and EU contribute to tensions, pushing China to localize production within Europe, and find ways to keep its limited access to the US market, such as through the Geely-owned Volvo's production plant in South Carolina (The New York Times, 2025).

The implications of such tariffs extend beyond immediate economic impacts. The harm to China's EV industry could potentially lead to reduced competitiveness and innovation, affecting global supply chains and consumer access to affordable EVs. For the US and EU, the benefits may include supporting domestic EV manufacturing, creating jobs, and potentially enhancing energy security. However, from an economic theory perspective, these tariffs can be analyzed through the lens of protectionism. Additionally, the theory of comparative advantage suggests that countries should specialize in producing and exporting goods and services in which they have a comparative advantage, and import those in which others have an advantage (Findlay, 1991). Tariffs, however, distort this natural trade flow, potentially leading to inefficiencies and higher consumer costs. In the case of the US and EU, the potential harm from decoupling includes disrupting established supply chains, raising production costs, and potentially escalating trade tensions. The benefit lies in the protection of domestic industries, which could lead to job creation and technological advancements.

It's crucial for policymakers to carefully weigh these considerations. While there are valid concerns about China's trade practices, abrupt decoupling could lead to unintended consequences, such as market disruptions, increased global tensions, and a general deterioration of the global efforts to cut carbon emissions. A more balanced approach might involve engaging in dialogue with China to address trade imbalances, while also investing in domestic innovation and sustainability in the EV sector. Policymakers should also consider the potential for collaborative initiatives, such as joint research and development projects, which could foster technological advancements without the need for disruptive tariffs. Additionally, focusing on creating a level playing field through international agreements and regulations could be more effective than unilateral tariffs in addressing perceived trade distortions.

If the US and EU were to completely decouple from China in terms of EV and battery production, it would involve severing all economic ties and self-sufficiently developing domestic EV and battery manufacturing capabilities. This approach would require significant investment in research and development, infrastructure, and workforce training. While this could theoretically reduce dependence on China, it would likely lead to increased costs due to the high initial investment required. Moreover, the time needed to develop such capabilities could extend beyond the urgency of addressing current market demands and environmental goals. Both the US and EU have well-established automotive industries with advanced technology and a high degree of innovation. The EU also has a strong focus on sustainability and environmental regulations, which can be advantageous in the EV sector. Despite their advantages, the US and EU do rely on China for most aspects of EV production.

Partial decoupling could involve a hybrid approach, maintaining some economic ties with China while simultaneously investing in enhanced domestic capabilities. This would allow for the gradual reduction of reliance on Chinese manufacturing, potentially mitigating risks associated with supply chain vulnerabilities. However, this strategy would require careful management to balance the need for reduced dependence with the economic benefits of existing supply chains. Additionally, the partial nature of decoupling might not fully address concerns over distortions in global trade due to subsidies and overcapacity in China's EV industry.

In the scenario where decoupling is not feasible due to economic interdependencies, technological collaborations, or market dynamics, the focus would shift to diplomatic and policy-based strategies. This could involve strengthening international trade agreements and regulations to address trade

imbalances and unfair practices. Additionally, the EU and US could pursue targeted tariffs and subsidies for their domestic industries to foster growth and competitiveness without disrupting the entire supply chain. Diplomatic efforts to engage China in discussions on trade reforms and environmental standards would also be crucial.

Conclusion

In conclusion, while the US and EU have the capability to produce EVs without direct Chinese involvement, it would require significant investment and time to establish alternative supply chains. It's also important to note that China, with its dominant position in production as well as R&D and key component technologies, could potentially use these as leverage in trade negotiations. While the impulse to protect domestic industries and decouple from China is ongoing, policymakers must carefully consider the long-term implications of such actions. A balanced approach that combines strategic dialogue, domestic investment, and collaborative international efforts may offer the best path forward for the US and EU in navigating the complexities of global EV trade. While addressing trade imbalances and ensuring fair competition is crucial, a complete decoupling could impose substantial economic and social costs. In all scenarios, maintaining open communication channels with China for dialogue on trade practices and environmental standards is essential. This could help in finding a balanced approach that safeguards global trade interests while promoting sustainable development in the EV industry.

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