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China's Electric Vehicle Export Surge: A Comtrade Window on Tariff Walls, 2020–2024

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Abstract

This commentary examines China's battery electric vehicle (BEV) export surge and the effectiveness of the tariff response through the lens of UN Comtrade trade statistics. Using HS subheading 870380 (pure electric vehicles) for the period 2020–2024, we document the trajectory of Chinese BEV exports from 193,905 units in 2020 to 1.55 million units (USD 34.13 billion) in 2023 and 1.65 million units (USD 31.97 billion) in 2024, with year-on-year volume growth decelerating sharply from 63.8% in 2023 to 6.8% in 2024 and export value declining 6.3%—the first value contraction in the series. Aggregate unit values fell 12.3% from USD 22,079 to USD 19,367, driven by compositional shifts toward lower-price markets as European destinations contracted. The tariff response has produced measurable but uneven effects: the US market is effectively closed under the 100% Section 301 tariff; EU imports declined substantially in southern member states (Spain fell 44.8%) after provisional countervailing duties took effect in July 2024, though the Belgian distribution hub partially masked end-market shifts; and Brazil's pre-tariff surge reached 72,847 units—substantially below earlier estimates of approximately 160,000. Chinese exports to open markets in Southeast Asia, the Middle East, and Latin America continued to expand, largely compensating for tariff-affected declines. We conclude that tariffs alone reroute trade flows and slow growth but do not halt the aggregate expansion, and that Chinese automakers are responding with an accelerating shift toward local production capacity inside the tariff walls they were designed to exclude.

Keywords: electric vehicles; China exports; tariffs; UN Comtrade; trade diversion; HS 870380

1. Introduction

In the space of four years, China transformed from the world's largest automobile market into the world's largest automobile exporter. In 2023, China exported approximately 4.91 million motor vehicles, overtaking Japan for the first time in history (GACC, 2024). By 2024, total vehicle exports surpassed 6.6 million units, with a combined free-on-board value exceeding USD 90 billion (UN Comtrade, 2026b). The driver of this acceleration was not the internal combustion engine (ICE) vehicles that had defined global automotive trade for a century, but a new category: battery electric vehicles (BEVs), exported under Harmonized System subheading 870380.

The numbers are striking. In 2024, China exported 1.65 million pure electric vehicles to 174 partner countries, generating USD 31.97 billion in export revenue (UN Comtrade, 2026b). Battery electric vehicles accounted for approximately one quarter of China's vehicle export volume but over one third of its

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export value—a premium that reflects the higher unit value of EVs relative to ICE vehicles and China's commanding cost advantage in the battery supply chain that accounts for roughly 40 percent of an EV's manufacturing cost (IEA, 2024).

This surge did not go unanswered. Between 2023 and 2024, the world's major auto markets erected a patchwork of tariff walls explicitly aimed at Chinese electric vehicles. The European Commission launched an anti-subsidy investigation in October 2023 and imposed provisional countervailing duties in July 2024, with company-specific rates ranging from 17.0 percent for BYD to 36.3 percent for SAIC (European Commission, 2024). The United States, which had already raised its Section 301 tariff on Chinese EVs from 2.5 percent to 27.5 percent during the first Trump administration, announced a further increase to 100 percent in May 2024, with the final determination taking effect on September 27, 2024, effectively excluding Chinese EVs from the American market (USTR, 2024). Brazil, which had emerged as a significant EV export destination by late 2023, began a phased restoration of import tariffs on electric vehicles in January 2024, moving from zero to a scheduled 35 percent by mid-2026 (Brazilian MDIC, 2023). Turkey imposed a 40 percent additional customs duty on Chinese EVs in 2023 (Government of Turkey, 2023), and Canada followed with a 100 percent surtax on Chinese EVs, effective October 2024 (Government of Canada, 2024).

These measures share a common stated rationale: that Chinese EV manufacturers benefit from unfair state subsidies and that the resulting export volumes threaten domestic automotive industries and, in the European case, the continent's green industrial transition. The counter-argument, advanced by Chinese officials and some trade economists, is that the tariffs are protectionist measures that will slow the global energy transition by raising the cost of electric vehicles for consumers (WTO, 2024).

The tariff response creates a natural experiment. If tariffs are effective, we should observe a deceleration of Chinese EV exports to protected markets after their imposition—or at least a deviation from the pre-tariff growth trajectory. If Chinese exporters can reroute shipments to unprotected markets, we should observe market diversification: declining shares for tariff-imposing destinations and rising shares for open ones. If neither effect is visible, the data would suggest that Chinese EVs enjoy cost advantages so large that even steep tariffs do not eliminate their competitiveness.

This commentary uses United Nations Comtrade data—specifically, HS subheading 870380 for pure electric vehicles—to examine these questions through the window of trade statistics for the period 2020 to 2024. Section 2 provides background on China's EV industry and the tariff measures. Section 3 describes the data and methodology. Section 4 presents the results, including annual aggregates, destination analysis, the tariff impact on major markets, unit value trends, and market diversion evidence. Section 5 discusses whether the tariffs are working, Europe's policy dilemma, and the adaptation strategies of Chinese automakers. Section 6 notes limitations, and Section 7 concludes.

The central finding is that tariff walls have produced measurable but uneven effects: they have virtually excluded Chinese EVs from the US market, redirected flows in Brazil, and contributed to declining European market shares for Chinese EV exports, particularly in southern European destinations. Yet Chinese EV exports in aggregate continue to grow, because the affected markets are being replaced by rapidly expanding demand in Southeast Asia, South Asia, the Middle East, and other developing regions where Chinese manufacturers are simultaneously building local production capacity. The tariff walls are rerouting trade flows, but they have not stopped the export expansion—though the deceleration from explosive growth to single-digit gains in 2024 signals that the combination of base effects and trade barriers is reshaping the trajectory.

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2. Background: China's Electric Vehicle Industry

2.1. Policy Foundations and Industrial Scale

China's emergence as the world's dominant EV producer is the product of two decades of sustained industrial policy. Beginning with the "Ten Cities, Thousand Vehicles" pilot program in 2009, the Chinese government deployed a portfolio of demand-side subsidies, supply-side production incentives, procurement mandates, and regulatory requirements that progressively tilted the automotive market toward electrification (Liu & Kokko, 2013). Consumer purchase subsidies, which ran from 2009 through the end of 2022, directly reduced the upfront cost of electric vehicles by amounts that reached as high as 60,000 yuan (roughly USD 8,500) per vehicle in earlier years. The New Energy Vehicle (NEV) mandate, introduced in 2017 and tightened annually, required automakers to earn credits proportional to their production volume by manufacturing or importing zero- and low-emission vehicles (MIIT, 2023).

By 2023, China accounted for over 60 percent of global electric vehicle sales and roughly 65 percent of global EV production (IEA, 2023). The manufacturing base had consolidated around a group of highly competitive firms. BYD, the largest, delivered over 3 million NEVs in 2023—more than Tesla's global deliveries—and has vertically integrated battery production, semiconductor design, and vehicle assembly. SAIC Motor, through its MG brand, became the largest single exporter of Chinese EVs to Europe, leveraging the brand recognition of the former British marque it acquired in 2007. Geely, which owns Volvo Cars and Polestar, exported through multiple brand channels, while pure-play EV exporters such as NIO and XPeng targeted the premium segment.

The cost structure underpinning China's export competitiveness is anchored in the battery supply chain. Chinese firms—led by CATL and BYD's FinDreams battery unit—controlled approximately 70 percent of global battery cell production capacity in 2023 (IEA, 2024). The upstream dominance extends to cathode materials, anodes, separators, and electrolyte, each of which Chinese producers supply at scales and costs that no other country currently matches. Industry estimates suggest that Chinese EV manufacturers enjoy a battery cost advantage of 20 to 30 percent relative to European and North American competitors, a gap that translates into a vehicle-level cost advantage of USD 5,000 to USD 10,000 per unit depending on the segment (Benchmark Mineral Intelligence, 2024; Ansumana & Li, 2023).

2.2. The Overcapacity Narrative

The scale of China's EV production has generated an increasingly prominent narrative of structural overcapacity. In 2024, China's domestic EV production capacity was estimated at approximately 20 million units per year against domestic demand of roughly 10 million units, yielding a capacity utilization rate below 60 percent (Rhodium Group, 2024). This gap—whether interpreted as temporary mismatch between capacity build-out and demand growth, or as structural overcapacity fueled by state-directed investment—has become the foundation of the tariff response. The European Commission's anti-subsidy investigation explicitly cited the capacity utilization gap as evidence that Chinese EV exports are not merely the result of comparative advantage but are enabled by subsidies that allow production at levels that would be unsustainable in a market environment (European Commission, 2024).

2.3. Timeline of Major Tariff Actions

The tariff response to China's EV exports escalated rapidly between mid-2023 and late 2024:

- **October 2023**: The European Commission initiated an ex officio anti-subsidy investigation into battery electric vehicles originating in China, invoking the EU's Basic Anti-Subsidy Regulation. The investigation covered the period from October 2022 to September 2023.
- **March 2024**: The European Commission required customs registration of Chinese EV imports, signaling that provisional duties could be applied retroactively from that date.

- **May 2024**: The United States announced that the Section 301 tariff on Chinese EVs would rise from 27.5 percent to 100 percent.
- **June 2024**: The European Commission published its provisional findings, proposing company-specific countervailing duties: BYD 17.0 percent, Geely 19.3 percent, SAIC 36.3 percent, other cooperating companies 21.3 percent, and non-cooperating companies 36.3 percent. The existing 10 percent most-favored-nation tariff on vehicle imports applied on top of these duties, yielding total tariff rates ranging from 27.0 to 46.3 percent (European Commission, 2024).
- **July 2024**: EU provisional duties entered into force on July 5, 2024.
- **September 27, 2024**: The US 100 percent Section 301 tariff increase on Chinese EVs became effective, following the USTR final determination published September 12, 2024 (USTR, 2024).
- **October 1, 2024**: Canada's 100 percent surtax on Chinese EVs took effect, pursuant to Order Amending the Customs Tariff (Electric Vehicles from China), SOR/2024-174, published in the Canada Gazette, Part II on September 18, 2024 (Government of Canada, 2024).
- **January 2024 onward**: Brazil began phasing in import tariffs on electric vehicles, starting at 10 percent, rising to 18 percent in July 2024, and scheduled to reach the full 35 percent Mercosur common external tariff rate by July 2026 (Brazilian MDIC, 2023).
- **2023–2024**: Turkey maintained a 40 percent additional customs duty on EVs imported from China, on top of the standard 10 percent tariff—yielding a 50 percent total rate (Government of Turkey, 2023).

The timeline reveals a coordinated, if not formally synchronized, global tariff response concentrated within a twelve-month window. This concentration makes the trade data for 2024 particularly informative: it captures both pre-tariff positioning and the initial post-tariff adjustment within a single calendar year.

3. Data and Methods

3.1. Comtrade Data and HS 870380

This analysis draws on United Nations Comtrade data accessed through the Comtrade preview API (annual series, all partners). The key data series is HS 2017 subheading 870380—"Vehicles, with only electric motor for propulsion"—which cleanly identifies pure battery electric vehicles. China is the reporter (code 156), and all data are from the export side (flow code X). Data were retrieved in September 2026 for the full period 2020–2024.

The HS 870380 subheading provides a cleaner separation of pure EVs from ICE vehicles than the parent heading 8703, which aggregates all passenger motor vehicles. This is analytically important because the tariff measures described in Section 2 specifically target battery electric vehicles. HS 8703 data are used as a comparator to benchmark EV export trends against China's overall vehicle export trajectory, where available.

3.2. Unit Value and Caveats

Unit value is calculated as the ratio of free-on-board export value (USD) to quantity (number of vehicles). This serves as a rough proxy for the average export price and, by extension, the market segment targeted by Chinese EV exports. The measure has well-known limitations: it does not distinguish between vehicle sizes, battery capacities, brand positioning, or trim levels within the same HS code. A unit value decline could reflect either genuine price reductions or a shift in the product mix toward smaller, lower-cost models. Conversely, a unit value increase could signal either upmarket movement or a compositional shift toward larger vehicles with bigger batteries.

3.3. Analytical Approach

The analysis proceeds in four steps. First, annual aggregates for 2020–2024 are presented to establish the scale and growth trajectory of China's EV exports. Second, the top destination markets are examined, with particular attention to the EU member states, Brazil, Thailand, Australia, Turkey, and the United States. Third, observed shifts in market shares between 2023 and 2024 are analyzed for evidence of trade diversion from tariff-imposing destinations to open markets. Fourth, unit value trends are examined to assess market segmentation and competitive dynamics.

All calculations are performed on Comtrade data extracted in September 2026. The 2024 annual figures are from the Comtrade preview endpoint and are subject to revision as late-reported shipments are incorporated. The EU is treated as the sum of its member states in the Comtrade bilateral data, since the EU as a customs union may not always appear as a single partner entity in the UN trade statistics.

4. Results

4.1. Annual Aggregates: Scale and Trajectory

Table 1 presents China's EV export volume, value, and unit value for HS 870380 over the period 2020–2024, derived directly from UN Comtrade API annual aggregates.

Table 1. China's Pure Electric Vehicle Exports (HS 870380), 2020–2024

Year	Volume (units)	Value (USD billion)	Unit Value (USD/vehicle)	YoY Volume Growth
2020	193,905	1.58	8,143	—
2021	498,256	8.59	17,248	+157.0%
2022	943,966	20.09	21,281	+89.5%
2023	1,545,831	34.13	22,079	+63.8%
2024	1,650,917	31.97	19,367	+6.8%

Source. UN Comtrade, HS 870380, China reporter (156), export flow. All data retrieved via Comtrade preview API, September 2026. Values in current USD, FOB.

The growth trajectory describes a classic S-curve: an explosive take-off phase (2020–2022) in which export volumes quadrupled, followed by a period of rapid but decelerating growth (2023), and finally a sharp deceleration to single-digit growth in 2024. The deceleration from 63.8 percent year-on-year growth in 2023 to 6.8 percent in 2024 represents a dramatic slowdown—far steeper than base effects alone would predict. For the first time in the five-year series, export value declined year-on-year, falling 6.32 percent from USD 34.13 billion in 2023 to USD 31.97 billion in 2024, even as volume continued to grow.

Unit values rose from USD 8,143 in 2020 to a peak of USD 22,079 in 2023, then declined to USD 19,367 in 2024, a drop of approximately 12.3 percent. This peak-in-2023 pattern differs from earlier estimates that placed the unit value peak in 2022. The sharp single-year decline from 2023 to 2024—the largest in the series—is consistent with a combination of competitive price pressure, compositional shifts toward lower-price markets as high-tariff destinations in Europe contracted, and the introduction of smaller, more affordable export models.

4.2. Top Destinations: Concentration and Shift

Table 2 reports the top ten destinations for Chinese EV exports by volume in 2024, with comparison to 2023 rankings and shares, all computed directly from UN Comtrade bilateral data.

Table 2. Top 10 Destinations for Chinese Pure EV Exports, 2024 vs. 2023

Rank 2024	Country/Region	Volume 2024	Share 2024	UV 2024 (USD)	Rank 2023	Volume 2023	Share 2023
1	Belgium	247,788	15.01%	26,958	1	175,437	11.35%
2	Thailand	114,050	6.91%	12,617	2	155,910	10.09%
3	Philippines	107,849	6.53%	1,475	4	115,423	7.47%
4	United Kingdom	103,155	6.25%	30,931	3	125,314	8.11%
5	India	77,743	4.71%	1,342	7	58,577	3.79%
6	Brazil	72,847	4.41%	17,054	13	36,921	2.39%
7	UAE	69,446	4.21%	19,529	15	34,610	2.24%
8	Australia	64,619	3.91%	26,764	6	86,437	5.59%
9	Israel	59,894	3.63%	23,798	9	50,541	3.27%
10	Indonesia	51,172	3.10%	12,885	20+	—	—

Source. UN Comtrade, HS 870380, China reporter (156), export flow, annual bilateral data. All figures from Comtrade preview API, September 2026. Partner codes mapped to ISO country names.

Additional notable destinations outside the top ten include: Spain (rank 11, 51,008 units, 3.09% share, down from rank 5 with 92,395 units and 5.98% share in 2023); Germany (rank 12, 44,844 units, 2.72% share, relatively stable from rank 11 with 41,156 units in 2023); Mexico (rank 14, 39,988 units, 2.42%); South Korea (rank 15, 38,060 units, 2.31%); Slovenia (rank 17, 29,381 units, 1.78% share); and Turkey (rank 18, 28,459 units, 1.72% share, down from 32,614 units in 2023).

Several patterns demand attention. Belgium remains the largest nominal destination, but its inflated share—rising from 11.35 percent to 15.01 percent—almost certainly reflects its role as a European distribution hub, with vehicles transiting through the Port of Zeebrugge to other EU markets. The combined decline in direct shipments to Spain (from 5.98% to 3.09% share), alongside stability in Germany and a slight decline in UK volumes, suggests that the EU tariff impact is uneven across member states and that distribution logistics through Belgium may be masking end-market shifts.

The Philippines and India present an analytical puzzle. Their unit values—USD 1,475 and USD 1,342 respectively—are an order of magnitude below the global average. These figures are inconsistent with passenger electric vehicles and likely represent low-speed electric vehicles, electric tricycles, or other small electric conveyances classified under HS 870380. Their inclusion in the top-five destinations by volume is therefore potentially misleading in a passenger-EV context, and their exclusion from the effective ranking for passenger BEVs would shift Thailand and the UK into the second and third positions respectively. This product heterogeneity within HS 870380 is a known limitation of HS 6-digit analysis (see Section 6).

Brazil's rise from rank 13 to rank 6 is the most dramatic single-country shift among major destinations, nearly doubling in volume from 36,921 to 72,847 units. However, this increase—while substantial—is far more modest than earlier estimates that placed Brazil at approximately 160,000 units. The confirmed figure of 72,847 units represents a 97.3 percent increase, which is consistent with pre-tariff stockpiling but does not support the narrative of a "tripling" of exports to Brazil.

Thailand, by contrast, experienced a volume decline from 155,910 to 114,050 units (a 26.8 percent decrease), dropping from a 10.09 percent share to 6.91 percent. This decline may reflect the early transition from direct imports to local assembly as Chinese manufacturers' Thai production facilities came online in 2024.

The United States is entirely absent from the top twenty, consistent with the effective market closure resulting from the 100 percent Section 301 tariff.

4.3. European Union: Observed Annual Shifts

Monthly Comtrade data for HS 870380 at the bilateral level were not available in the dataset retrieved for this analysis, precluding a direct test of front-loading behavior ahead of the July 2024 EU provisional duty deadline. Claims of specific monthly surge and decline percentages for EU destinations cannot be verified from the current evidence base and are not made here.

What the annual bilateral data do reveal is a pattern of differential impact across EU member states. Spain, which ranked fifth among all destinations in 2023 with 92,395 units (5.98% share), fell to eleventh in 2024 with 51,008 units (3.09% share)—a 44.8 percent volume decline. Germany moved from 41,156 units (rank 11, 2.66% share) to 44,844 units (rank 12, 2.72% share), essentially stable. Slovenia rose from 34,801 units (2.25% share) to 29,381 units (1.78% share), a modest decline. The Netherlands and France, which were significant destinations in 2023 (ranks 8 and 16 respectively), fell outside the top twenty in 2024.

The divergence between Spain's sharp decline and Germany's stability within the EU market is noteworthy. It may reflect differences in the brand mix—SAIC's MG brand faced the highest countervailing duty rate (36.3%) and has historically been strong in southern European markets—or differences in the distribution logistics through Belgium noted above. Without monthly data, it is not possible to determine how much of Spain's annual decline reflects a post-July tariff effect versus other factors.

The European picture that emerges from annual data is one of market share erosion concentrated in specific member states, with aggregate EU-directed volumes partially sustained through the Belgian distribution channel. The net effect on end-market demand for Chinese EVs in Europe cannot be precisely measured from annual bilateral data alone, but the direction is clear: the EU market is becoming more challenging for Chinese EV exporters, and the adjustment is uneven across member states.

4.4. The Brazil Phenomenon

Brazil warrants detailed treatment because it illustrates a tariff dynamic distinct from both the EU and US cases. Unlike the EU's countervailing duty approach—which imposes a permanent cost increase calibrated to alleged subsidy margins—Brazil's tariff restoration was pre-announced and phased. This created a classic intertemporal substitution effect: importers accelerated purchases to capture the low-tariff window, producing an import surge that was at least partly a timing shift rather than a reflection of steady-state demand.

The confirmed data show Chinese EV exports to Brazil rising from 36,921 units in 2023 to 72,847 units in 2024—a 97.3 percent increase. Brazil's share of China's total EV exports rose from 2.39 percent to 4.41 percent over the same period. While substantial, this near-doubling is less dramatic than the approximately threefold increase estimated in earlier analyses, which had placed Brazil at roughly 160,000 units for 2024. The corrected figure of 72,847 units is derived directly from the UN Comtrade bilateral record and should be treated as the authoritative annual total.

The surge was enabled by Brazil's zero-tariff regime for EVs—a policy designed to encourage electrification—which created a narrow window before the phased tariff wall began rising. The Brazilian tariff schedule moved from zero to 10 percent in January 2024, then to 18 percent in July 2024, with further increases to 25 percent and ultimately 35 percent by July 2026.

The Brazilian case raises a question that will only be fully answerable with 2025 data: what is the steady-state demand for Chinese EVs in Brazil under the escalating tariff schedule? If the 2024 increase was primarily a timing shift, 2025 volumes should decline. If Chinese EVs remain competitively priced even at higher tariff rates—as they do in several other Latin American markets—the decline may be more modest. The outcome will depend on whether the pre-announcement pulled forward one to two years of demand or merely a few months.

4.5. Unit Value Trends: Market Segmentation

The aggregate unit value of China's EV exports rose from USD 8,143 in 2020 to a peak of USD 22,079 in 2023, then declined sharply to USD 19,367 in 2024—a drop of USD 2,712 or 12.3 percent in a single year. This aggregate trend, however, masks important compositional effects.

The 2024 bilateral data reveal a clear unit-value hierarchy across destination markets. Exports to developed Western markets carry substantially higher unit values: the United Kingdom at USD 30,931, Belgium at USD 26,958, Australia at USD 26,764, and Germany at USD 29,154. These figures are consistent with exports of mid-range to premium passenger EVs, including MG and Polestar models.

Exports to middle-income and developing markets fall into two distinct tiers. A mid-tier—Brazil at USD 17,054, the UAE at USD 19,529, Israel at USD 23,798, and Mexico at USD 18,149—reflects a mix of affordable passenger EVs. A lower tier—Thailand at USD 12,617, Indonesia at USD 12,885—suggests smaller, lower-cost models or a higher proportion of commercial and low-speed electric vehicles.

The ultra-low unit values for the Philippines (USD 1,475) and India (USD 1,342) are, as noted in Section 4.2, almost certainly not passenger EVs. These volumes likely represent electric tricycles, low-speed vehicles, or other small electric conveyances. Their presence in the top-ten ranking by volume highlights the heterogeneity problem within HS 870380 and the need for caution in interpreting aggregate unit value trends.

The compositional interpretation of the 2023–2024 unit value decline is supported by the destination-share shifts described above. As the European share of China's EV exports declined—particularly the higher-unit-value Spanish and French markets—and as lower-unit-value markets in Southeast Asia, South Asia, and Latin America gained share, compositional reweighting mechanically pushed down the aggregate average. This does not rule out genuine price competition, but it suggests that the observed aggregate unit value decline is primarily a compositional story, not evidence of across-the-board price cutting.

4.6. Market Diversion: Tariff-Imposing vs. Open Markets

A central question raised by the tariff wave is whether Chinese EV exports are being diverted from protected markets to open ones. The annual bilateral data provide partial evidence for such diversion.

Among tariff-imposing destinations, the pattern is mixed but generally negative. The United States is effectively absent. Spain (EU tariff, July 2024) fell 44.8 percent. Turkey (50% total tariff) fell 12.7 percent from 32,614 to 28,459 units. Thailand, while not a tariff-imposing market in the traditional sense, saw a decline that may reflect localization rather than trade diversion.

Among open or lower-tariff destinations, several markets posted strong gains. Brazil nearly doubled, though this surge occurred within a narrowing low-tariff window. The UAE grew from 34,610 to 69,446 units (a 100.6 percent increase). Indonesia entered the top ten for the first time. India grew from 58,577 to 77,743 units. Israel grew from 50,541 to 59,894 units. Mexico more than doubled its volume to enter the top fifteen.

These patterns are consistent with trade diversion, but they do not establish it causally. Many of the growing markets—the UAE, Indonesia, Mexico—are simply large and expanding automotive markets where Chinese EVs are gaining share through competitive pricing and early-mover advantages, not merely because European and American doors are closing. The simultaneous growth in multiple open markets suggests that the underlying driver is the global competitiveness of Chinese EVs, with tariffs determining the specific channels through which that competitiveness is expressed rather than the total volume.

5. Discussion

5.1. Are Tariffs Working?

The answer depends on how ”working” is defined. If the objective is to prevent Chinese EVs from entering a specific national market at scale, the tariffs are demonstrably effective: the United States is effectively closed, and imports into several EU member states have declined substantially. If the objective is to protect domestic auto manufacturing employment in tariff-imposing countries, the verdict is more ambiguous—the tariffs raise consumer prices, slow EV adoption, and may simply redirect Chinese investment toward local production rather than exports.

If the objective is to slow the global expansion of China’s EV industry, the evidence suggests that tariffs alone are having a partial effect. Chinese EV exports to non-tariff markets—South and Southeast Asia, the Middle East, Latin America, and Oceania—continue to grow, largely compensating for the decline in tariff-affected destinations. The aggregate export volume in 2024, at 1.65 million units, was 6.8 percent higher than in 2023, despite the simultaneous imposition of tariffs by the EU, US, and Brazil. However, this growth rate represents a dramatic deceleration from the 63.8 percent recorded in 2023, and the decline in aggregate export value—down 6.32 percent—suggests that the tariff walls are compressing the unit economics of China’s EV export machine. The tariff walls are rerouting trade flows and slowing the growth rate; they have not reversed the expansion, but they have meaningfully altered its character.

5.2. Europe’s Dilemma

The European Union faces a particularly acute policy dilemma. On one hand, the automotive industry is central to the European economy, directly employing approximately 2.6 million workers in manufacturing and an additional 10 million indirectly (ACEA, 2024). The prospect of Chinese competition in the EV segment—where European automakers are already struggling to match the cost structures of Tesla and, increasingly, Chinese brands—threatens a politically sensitive industrial base.

On the other hand, the EU has committed to ending the sale of new internal combustion engine vehicles by 2035, a target that requires a massive expansion of EV availability at prices that European consumers can afford (European Parliament & Council, 2023). Chinese EVs, even with the countervailing duties, remain among the most affordable electric vehicles available in Europe. The MG4, for example, retailed in Germany at approximately €32,000 before duties—competitive with the Volkswagen ID.3—and the additional tariff burden of 21.3 to 36.3 percent pushes it into a higher price bracket where it competes less directly with European mass-market EVs.

The European Commission’s calibrated approach—differentiated rates based on company cooperation and subsidy exposure—reflects an attempt to balance these competing objectives: preserving price competition in the EV market while penalizing the firms judged to have received the largest subsidies. Whether this calibration succeeds will become evident over 2025–2026 as both post-tariff trade data and European EV registration data accumulate. The sharp decline in Spanish imports and the relative stability of German imports in 2024 suggest that the tariff impact may vary significantly across member states, potentially creating political tensions within the EU over the distribution of protection.

5.3. Chinese Automakers’ Strategic Adaptation: From Export to Localization

The most consequential response to the tariff walls may not be visible in the trade data: the accelerating shift from export-based market entry to local production. Chinese automakers have announced or begun construction of assembly plants in at least ten countries outside China, with the most significant investments concentrated in regions that are either strategically important markets or tariff-jumping production platforms.

BYD is building a manufacturing facility in Hungary—its first passenger car plant in Europe—with an announced capacity of 150,000 vehicles per year and a target start date of 2026 (BYD, 2024). In Thailand, BYD's plant began production in mid-2024, targeting both the domestic Thai market and exports to other ASEAN countries under the ASEAN Free Trade Area. The decline in Thai import volumes from China in 2024 (from 155,910 to 114,050 units) may already reflect the initial substitution of locally assembled vehicles for direct imports. In Brazil, BYD is converting a former Ford plant in Camaçari, Bahia, into an EV manufacturing facility with an eventual capacity of 150,000 units per year (BYD, 2023). SAIC has announced a European plant location under evaluation, and Geely has expanded production through its Volvo and Polestar operations, which already manufacture in Europe and the United States.

This pattern—respond to export tariffs by building local factories—is familiar from the history of Japanese automakers in the 1980s, who responded to US voluntary export restraints by building transplant factories in Ohio, Tennessee, and Kentucky (Berry et al., 1999). The historical parallel suggests that tariffs on Chinese EVs may accelerate, rather than prevent, the globalization of Chinese automotive manufacturing. Within a decade, "Chinese EV" may denote the corporate nationality of the manufacturer rather than the country of production, in the same way that a Toyota Camry assembled in Kentucky is understood as a domestically produced vehicle in the American market.

5.4. The Overcapacity Question and the Dumping Debate

The overcapacity narrative—that China produces far more EVs than its domestic market can absorb—is central to the policy justification for tariffs. The Comtrade data, however, do not directly speak to the dumping question in its technical trade-remedy sense. Dumping requires evidence that export prices are below normal value (typically, the home-market price) or below cost of production. Unit values derived from customs data are too aggregated to support or refute dumping allegations at the firm or model level.

What the aggregate data do show is that the unit values of Chinese EV exports have been declining—sharply in 2024—and that the range across destinations is wide. Chinese firms are selling EVs at prices that no European, American, or Japanese manufacturer can currently match for comparable specifications. Whether this reflects genuine comparative advantage in battery costs, economies of scale, and process innovation—or whether it is enabled by subsidies that allow below-cost pricing—is a question that trade statistics alone cannot resolve. The European Commission's investigation provides the most detailed publicly available analysis of the subsidy channels, finding that Chinese EV producers benefit from preferential financing, below-market land and utility costs, input subsidies for batteries and raw materials, and direct grants (European Commission, 2024).

6. Limitations

This analysis is subject to several important limitations. First, Comtrade data for 2024 are based on the preview release and are subject to revision as final annual data are compiled. Late-reported shipments, particularly through intermediary ports, may alter the annual totals and the ranking of destinations.

Second, HS 870380 captures pure battery electric vehicles but excludes plug-in hybrid electric vehicles (PHEVs, HS 870360), which represent a growing share of China's NEV exports. The exclusion of PHEVs means that the analysis understates the total scale of China's electrified vehicle exports, although PHEVs have generally not been targeted by the same tariff measures as pure BEVs.

Third, the analysis treats reported destination as the final market, but transshipment through entrepôt ports—particularly Zeebrugge (Belgium), Rotterdam (Netherlands), and Piraeus (Greece)—means that the ultimate destination of some vehicles differs from the Comtrade partner country. This is especially relevant for Belgium's inflated standing in the top-ten rankings.

Fourth, unit value analysis at the HS 6-digit level aggregates vehicles of vastly different sizes, battery capacities, and market segments. The ultra-low unit values observed for the Philippines and India (USD 1,475 and USD 1,342, respectively) strongly suggest the inclusion of non-passenger electric vehicles—such as electric tricycles and low-speed vehicles—within the same HS code. This product heterogeneity means that aggregate volume and unit value figures should be interpreted with caution, particularly for destinations where small electric vehicles dominate the HS 870380 record.

Fifth, monthly bilateral data for HS 870380 were not available in the dataset retrieved for this analysis, precluding direct tests of front-loading behavior ahead of tariff deadlines. The annual comparisons presented here capture net shifts across full calendar years and may understate the magnitude of within-year adjustments.

Sixth, 2024 captures only the initial months of the post-tariff regime in the EU and Brazil, and no post-tariff data at all for the US 100 percent rate (effective September 27, 2024) and Canada's surtax (effective October 2024). The full equilibrium effects of the tariff walls will not be visible until 2025–2026 trade data become available.

Finally, this analysis does not account for Chinese EV exports that are routed through third countries for final assembly—a practice known as knockdown kit assembly—which may result in vehicles being recorded as exports from a different reporter country in Comtrade.

7. Conclusion

China's electric vehicle export expansion between 2020 and 2024 represents one of the most consequential developments in global trade in the early 2020s. In four years, China went from exporting fewer than 200,000 pure electric vehicles to shipping 1.65 million units to 174 countries. The speed and scale of this expansion triggered a coordinated tariff response from the world's major automotive markets, creating a natural experiment in whether trade barriers can contain a cost-competitive export wave.

The evidence through 2024, now anchored in directly retrieved UN Comtrade data, suggests that tariffs are partially effective. They can close individual markets—the United States is the clearest example—and they can reduce import volumes in protected markets, as the sharp decline in Spanish imports and the broader erosion of direct EU-market shares indicate. The deceleration of aggregate volume growth from 63.8 percent in 2023 to 6.8 percent in 2024, combined with a 6.32 percent decline in export value, signals that the combination of tariff barriers and base effects is reshaping the trajectory of China's EV export expansion.

Yet the tariffs have not stopped the aggregate growth, because the volume redirected from tariff-imposing destinations is finding absorptive capacity in the large and growing automotive markets of the developing world—Southeast Asia, South Asia, the Middle East, and Latin America. Three structural forces suggest that this pattern will persist. First, China's battery cost advantage—rooted in a vertically integrated supply chain that no other country has yet replicated—provides a margin buffer that allows Chinese EVs to absorb substantial tariffs and remain price-competitive in many markets. Second, the global fleet transition toward electrification, reinforced by climate policy and falling battery costs, is expanding the total addressable market for EVs faster than tariffs can contract the accessible portion for Chinese exporters. Third, Chinese automakers are responding to tariffs by shifting from export to investment, building local production capacity in the very markets that are erecting tariff walls, in a pattern that recapitulates the Japanese auto industry's globalization in the 1980s and 1990s.

The policy implication is that tariffs alone will not insulate domestic automotive industries from Chinese competition. The combination of tariffs with industrial policy—subsidies for domestic battery production, accelerated EV model development by domestic manufacturers, and investment in charging infrastructure—may be more effective. The alternative, which the data suggest is already underway, is a

global automotive industry in which Chinese firms are not only the dominant exporters but increasingly the dominant producers, located inside the tariff walls they were designed to exclude.

Statements

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