Mind the Curve!

On Structural Shifts in the European Automotive Industry

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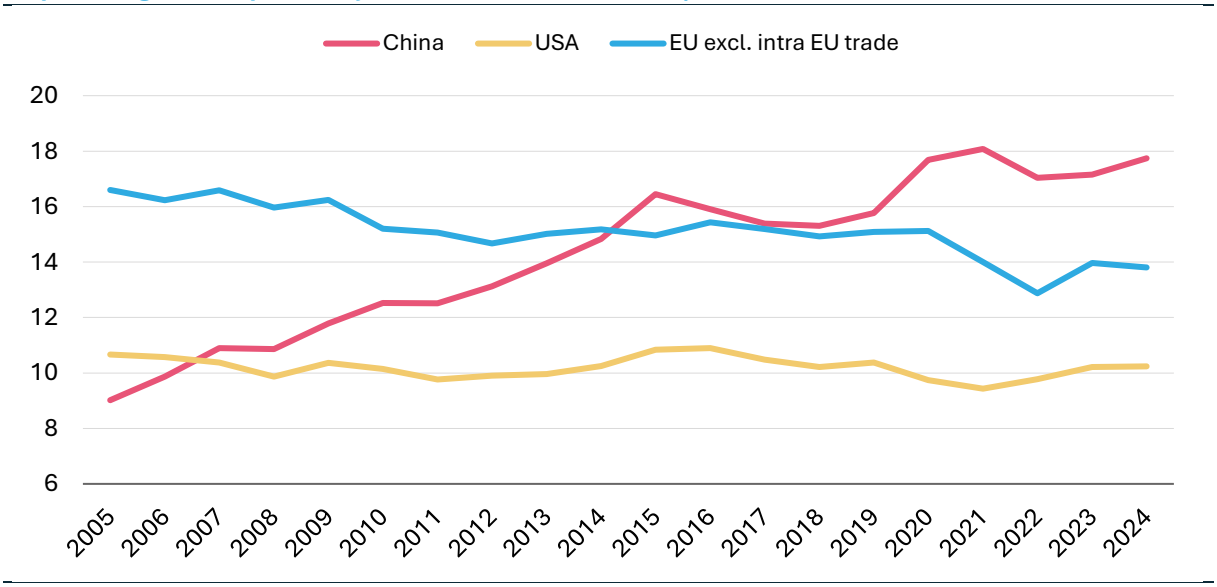
The European Union is no longer the largest player in the global goods market. This shift is driven primarily by competition from China, which produces increasingly sophisticated products at low prices. One consequence has been the stagnation of the German economy, partly reflecting difficulties in its automotive sector. Within just five years, China has transitioned from a net importer of cars into a net exporter, with a global market share in automotive trade now comparable to that of Japan. Chinese carmakers currently control two-thirds of their domestic market, whereas before the pandemic they held just over one-third. Although only around 8 percent of Slovak car exports are shipped directly to China, Chinese final demand is as important for Slovakia's automotive industry as demand from Germany and the United States. For Slovakia, competing in this environment will be challenging; however, the relatively lower production costs compared with plants in Western Europe could provide a competitive advantage.

Europe is no longer the largest player in global goods trade. While the shares of the EU and China in world trade were nearly identical between 2012 and 2019, the post-pandemic period marked a turning point: the EU began losing ground, while China expanded its position (Figure 1). The EU's share of global goods trade currently stands at around 14 percent—higher than in the United States, but lower than in China. Nevertheless, the EU's single market remains among the largest in the world, alongside those of China and the United States. With approximately 450 million inhabitants, the EU exceeds the U.S. market of about 350 million people. Europe's high standard of living is due in large part to the liberalization and globalization of international trade. The EU's trade openness amounts to roughly 20 percent of its GDP, comparable to China, whereas in the United States it is only about 10 percent.

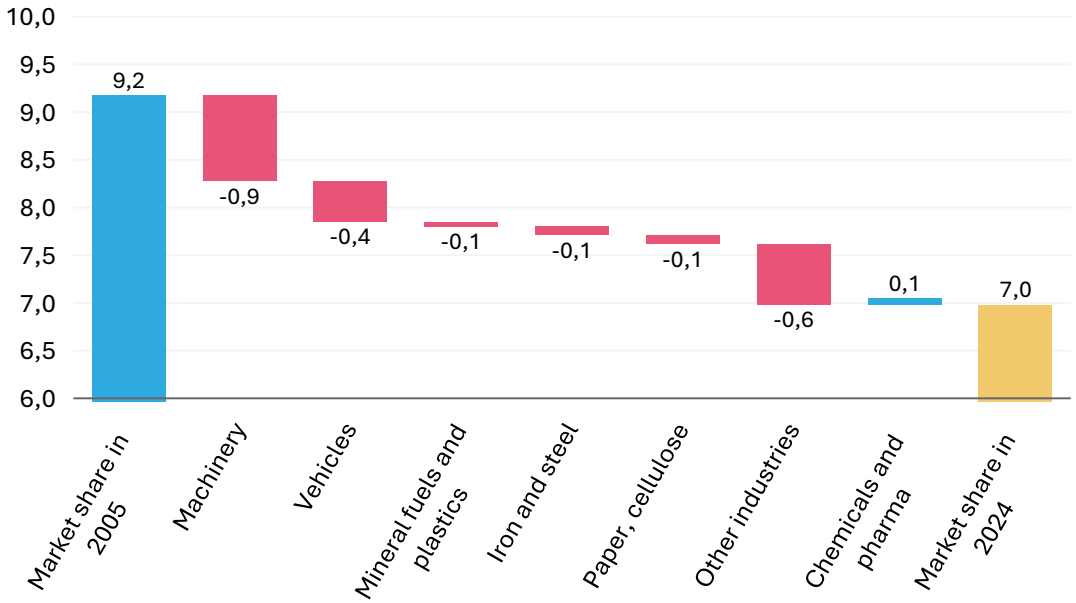
Figure 1: China has attained a dominant position in global trade and captured key markets (share of exports in global imports, adjusted for intra-EU trade, %)



Source: own calculations based on Trade Map, IFP

Germany is the EU's export powerhouse, yet its economy has stagnated in recent years, largely due to rising competition from China. Europe's largest economy built its prosperity on export oriented industrial production. While the ratio of goods to services exports in the United States is roughly 2 to 1, in Germany it is closer to 3 to 1. Although Germany is nominally the world's third-largest economy, exports account for about 45 percent of its GDP—significantly more than in either the United States or China. Alongside a broad range of engineering products, automobiles have become Germany's flagship export. However, external shocks and the rapid expansion of Chinese competition have weakened the country's position. Since the pandemic, the German economy has failed to grow and has been losing share in global trade. Germany's market share in the automotive sector has declined by about one-fifth since 2005, while its overall trade share has fallen by nearly one-quarter over the same period (Figure 2).

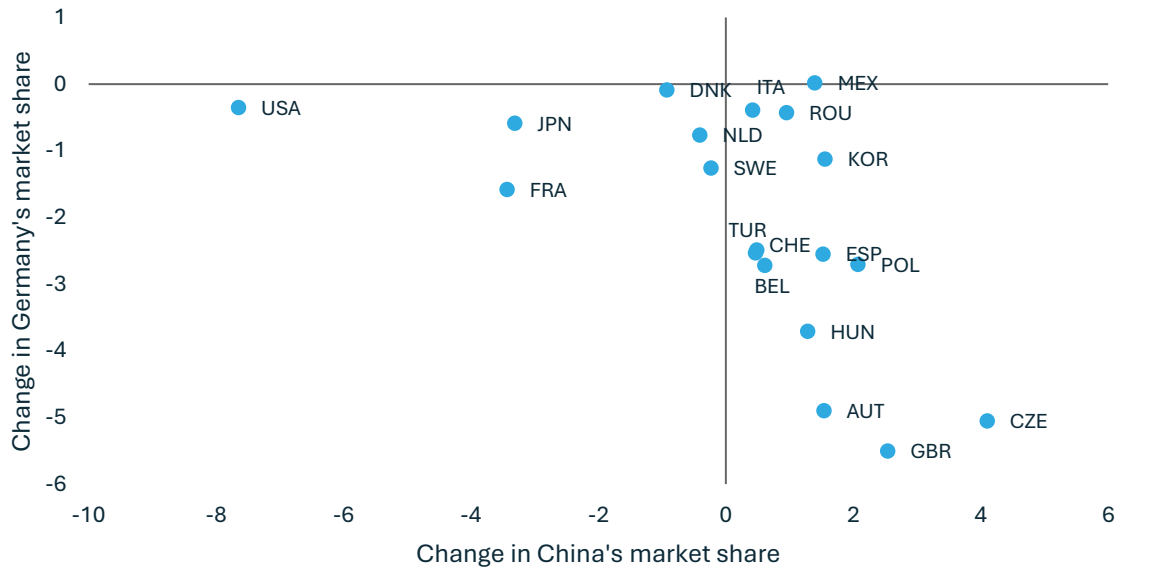
Figure 2: Germany's share in global goods trade has declined by nearly one quarter since 2005 (% and contributions in percentage points)



Source: own calculations based on Trade Map, IFP

China has been one of Germany's most important export markets outside the EU, yet in recent years German exports to China have declined sharply. The share of goods exported to China in Germany's total exports increased from 2.7 percent in 2005 to nearly 8 percent in 2021, when it reached its nominal peak. China thus became Germany's second-largest trading partner outside the EU. Exports consisted mostly of automobiles, as well as other durable goods such as industrial machinery. Since 2022, however, the trend has reversed. Total German exports to China have fallen by as much as 20 percent, and China's share in German exports has dropped below 6 percent. Imports of German industrial products enabled China to expand into international markets, supported by the rising sophistication of Chinese manufacturing. Chinese producers have begun to compete away Germany's market share in several of its key export markets, particularly in Europe (Figure 3). In the United States, by contrast, China's expansion has been constrained by the growth of protectionist measures. Alongside its machinery sector, China has also developed a rapidly expanding automotive industry.

Figure 3: China has begun to push Germany out of its most important export markets (change between 2015 and 2023, percentage points)

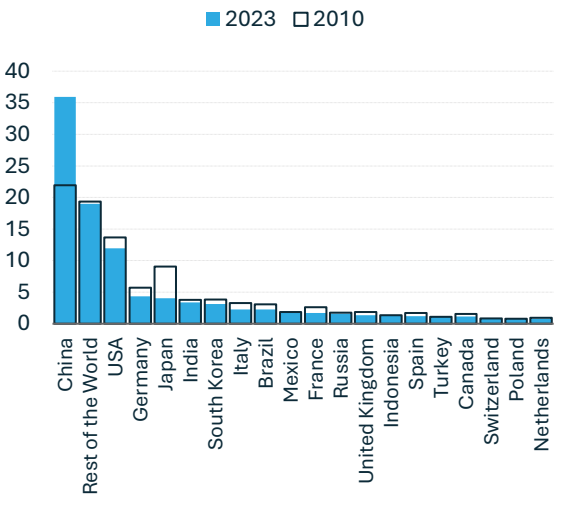


Source: own calculations based on UN Comtrade, IFP
Note: change between 2015 and 2023, Germany's most important trading partners

CHINA HAS LEARNED TO MANUFACTURE CARS ON A MASSIVE SCALE

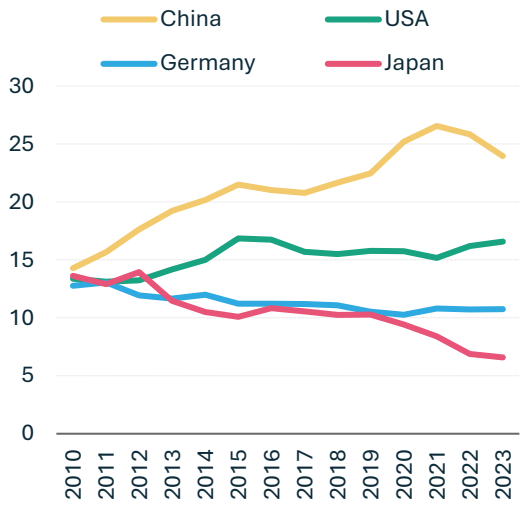
Although cars were manufactured in China even before 2019, after 2019 China began sharply increasing car exports, while imports declined, and domestic brands started displacing foreign manufacturers from the market. The trade balance in automobiles shifted from a deficit of USD 38 billion in 2019 to a surplus of USD 52 billion in 2024. In just a few years, China transformed from a net importer into a net exporter on an enormous scale. Today, China dominates industrial production with a share of over 35 percent and the automotive sector with a share of around 25 percent (Figure 4 and Figure 5).

Figure 4: In industrial production, China dominates the world (share of global manufacturing, in percent)



Source: Eurostat, IFP

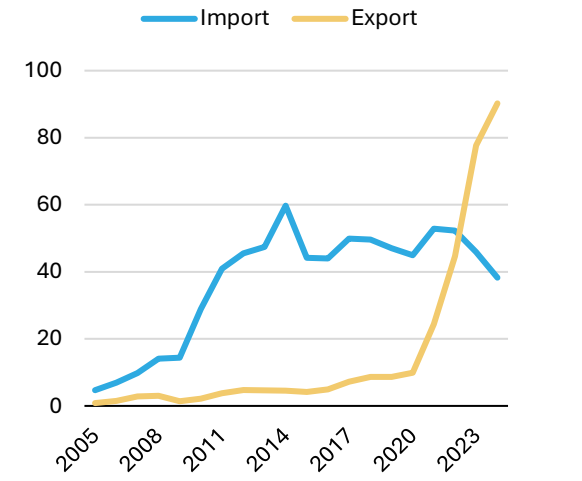
Figure 5: China has also significantly increased car production (share of vehicles in global manufacturing, in percent)



Source: Eurostat, IFP

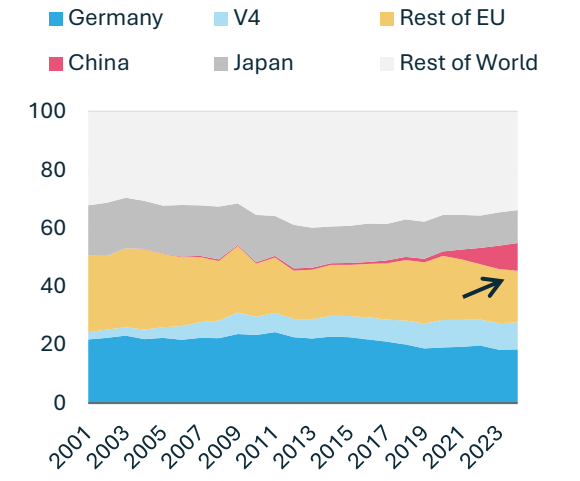
Car exports from China increased tenfold between 2019 and 2024, rising by almost 1000 percent and crushing the competition (Figure 6). Over the same period, global car exports in current prices grew by only 24 percent. Before the pandemic, China was the 19th largest car exporter, with a global market share of less than a third of Slovakia's. However, it has now moved up to 3rd place[1]. The share of Chinese car exports in global car exports essentially went from almost nothing before the pandemic to 9.5 percent in 2024 (Figure 7). The biggest losses in market share during this period were suffered by the EU, Canada, Japan, the USA, and the United Kingdom. For example, German exporters are losing the most where China is gaining the most (Figure 8). However, the share of cars in China's total exports is currently only 2.5 percent. If it were to reach 10 percent in the future—the level observed in Japan or South Korea—China's share of global car exports would surpass that of the EU, which currently stands at around 19 percent (after excluding intra-EU trade).

Figure 6: China became a net exporter of automobiles within just a few years... (current prices in USD billion, passenger vehicle category)



Source: TradeMap, IFP

Figure 7: ...and gained a market share comparable to Japan (market shares in the passenger vehicle category, percent)

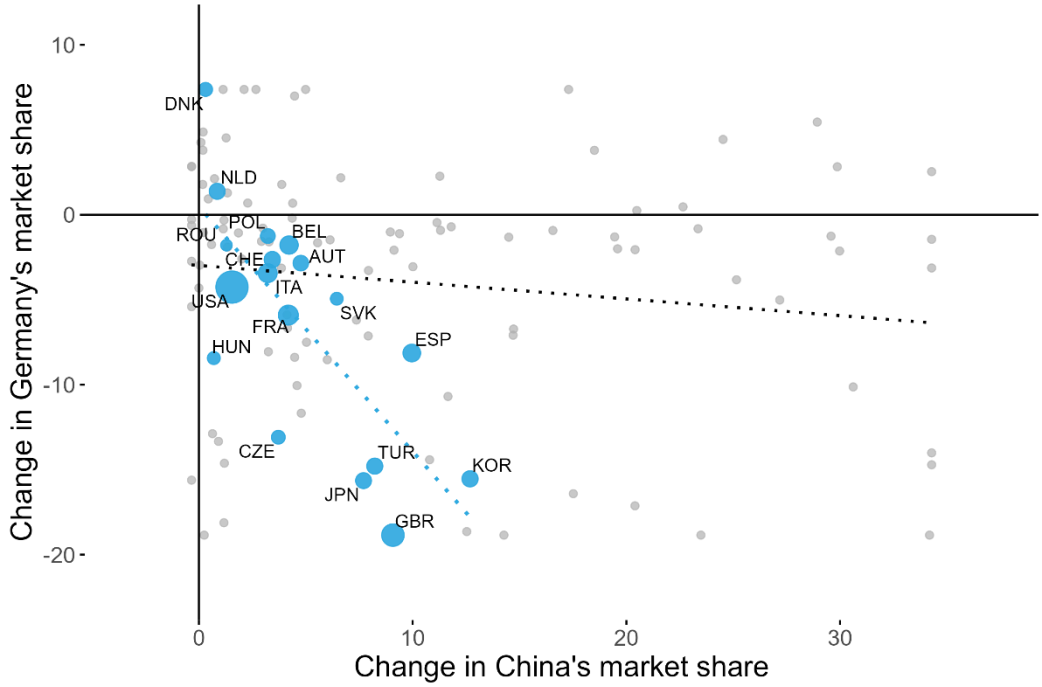


Source: TradeMap, IFP

[1] Exports are diversified: about 19% go to the EU, 17% to Russia, 10% to the Arabian Peninsula, roughly 4% each to the USA, Mexico, Australia, and Brazil, and the rest is scattered across Asia and South America.

At the same time, Chinese car imports are falling sharply, which further worsens the situation for manufacturers in the EU. In 2019, Chinese imports accounted for roughly 7 percent of the value of global car imports, but by 2024 this has dropped to less than 4 percent. The share of car imports into China has fallen by nearly half—a decline not seen in any other major economy in the world. The situation would not be alarming if European brands were at least able to expand production in China and sell directly on the domestic market. However, this is not happening.

Figure 8: Chinese cars are displacing German ones (passenger vehicles)



Source: own calculations based on UN Comtrade, IFP

Note: change between 2015 and 2024 in the passenger car category; blue dots represent Germany's most important trading partners; the size of the dot indicates the importance of the market for Germany.

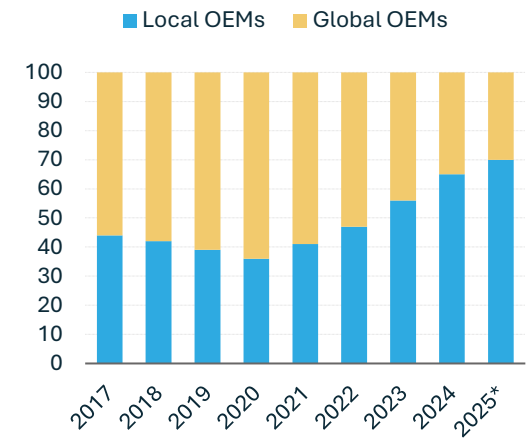
However, China heavily subsidizes car production. According to the IMF, China has long spent roughly 3% of the sector's added value annually to support the automotive industry. The support mainly takes the form of direct subsidies, tax breaks, cheaper loans, and discounts on land purchases. The level of subsidies is so significant that China is able to offer its models in the EU at lower prices than domestic competitors, despite import tariffs and the higher premium margins typical for European manufacturers. Foreign producers operating in China may apply for support as well, but domestic manufacturers receive far more resources from the state[2].

[2] See Analysis by Rhodium Group: https://rhg.com/research/why-are-chinese-evs-so-cheap/

Chinese brands have taken over the domestic market. Chinese consumers have stopped buying foreign car brands, whose sales are now in the minority. In 2019, foreign brands accounted for over 60 percent of the Chinese market, but by 2024 this had fallen to just 35 percent (Figure 9). Sales of local brands grew by 23 percent last year, while the decline of German, Japanese, and American automakers came in at double digits. At this pace, foreign brands could become completely irrelevant in the Chinese market by 2030.

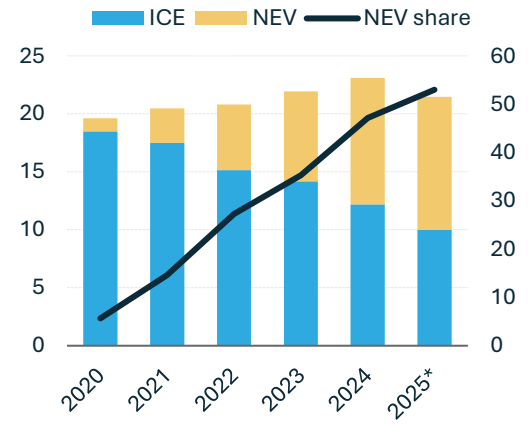
Chinese households are massively purchasing electric and hybrid vehicles, whose sales now exceed those of traditional internal combustion cars. China is undergoing a rapid green transformation of its automotive sector, producing electric vehicles domestically. One reason for this rapid shift may be that battery electric vehicles contain fewer components and are therefore simpler to develop and manufacture. The share of electric and hybrid vehicle sales in China exceeded 50 percent in the second half of 2024 (Figure 10). Before the pandemic, this share was practically zero. For comparison, it was about 55 percent in the EU in 2024 and only 22 percent in the USA. The aforementioned decline in car imports into China largely concerns internal combustion vehicles, which account for roughly 85 percent of the reduction. This development reflects growing domestic demand for eco-friendly alternatives and simultaneously indicates weak interest in foreign new-energy vehicles models.

Figure 9: Domestic brands are gaining an increasingly larger share in China... (percent)



Note: Data for 2025 are for the period from Jan. to Nov.
Source: CPCA, Automobility, IFP

Figure 10: ...and the share of sales of hybrid and electric vehicles is rising sharply (million units)

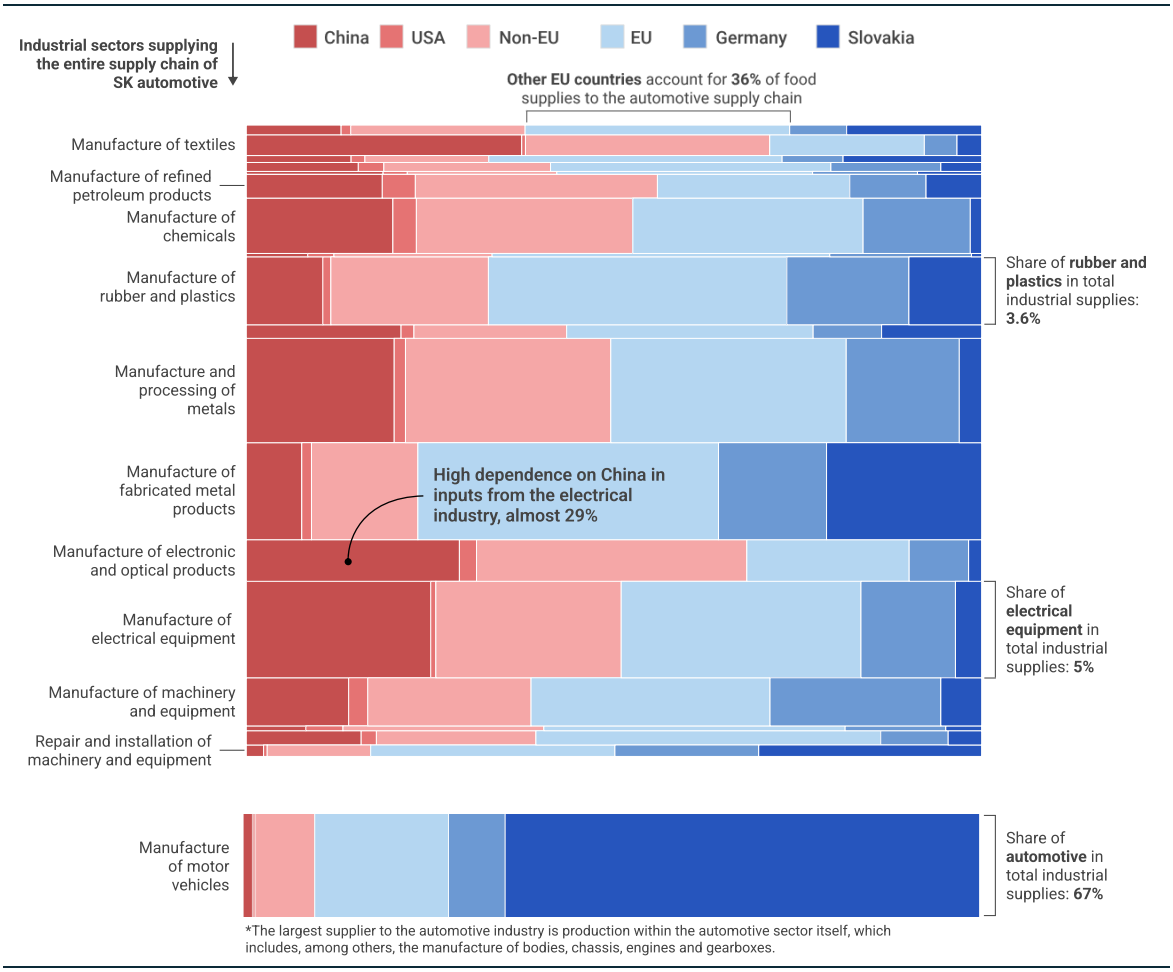


Note: Data for 2025 are for the period from Jan. to Nov.
Zdroj: CAAM, Automobility, IFP

BESIDES CHINA SHOCK, THE AUTOMOTIVE INDUSTRY SUFFERS FROM BOTH SUPPLY AND DEMAND DISRUPTIONS

Disrupted supply chains have driven car prices to record highs and continue to interrupt production even today. Consumer car prices in the EU and the USA have risen by more than a quarter from 2021 to 2024, including used cars. The reason lies in supply chains that were disrupted during the pandemic and were unable to fully coordinate after economies reopened. Lower car supply could not meet the high demand during the pandemic, pushing consumer prices upward. Car production costs, however, did not increase significantly. Even today, automakers must halt production due to chip shortages. The Slovak automotive industry is particularly dependent on supplies from China, especially for inputs from the electronics sector (Figure 11).

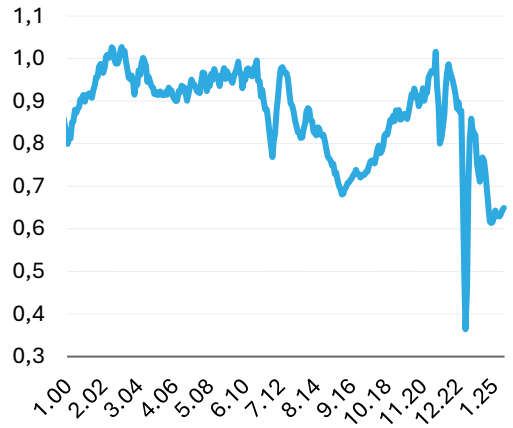
Figure 11: The structure of supplier industries for the Slovak automotive sector shows a higher dependence on supplies from China for inputs from the electronics industry (2023)



Source: Eurostat, IFP

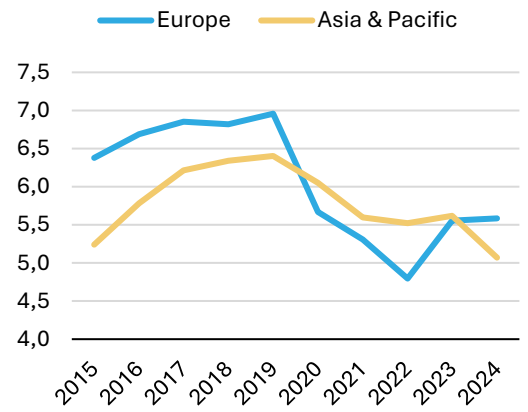
At the same time, car demand in the EU has weakened, and registrations have been declining for an extended period. One consequence of Germany losing market share to China is naturally lower economic performance, resulting in reduced household income and consumption. This is also reflected in lower car purchases. Car purchases in the EU27 (in constant prices) only caught up to 2019 levels by 2024. On top of this shortfall, one must also account for the drop in investment purchases of cars by companies and businesses. Across the EU27, the value of these investment purchases is roughly equal to that of household purchases, but the volume is more than 5 percent lower than in 2019. Overall car registrations in the EU have still not recovered since the pandemic and remain about 24 percent below pre-pandemic levels (Figure 12). European automakers are therefore experiencing a double shock, with demand for their products cooling both in their traditional European market and in the growing Asian markets.

Figure 12: Car registrations in the euro area have not recovered since the pandemic and are nearly a quarter below the long-term average (million units, monthly)



**seasonally adj.* *Sourcej: ACEA, IFP*

Figure 13 : The declining EU market was compounded by a drop in sales of German automakers in Asia (million units, annual)



Source: annual reports of VW, Mercedes, BMW, IFP

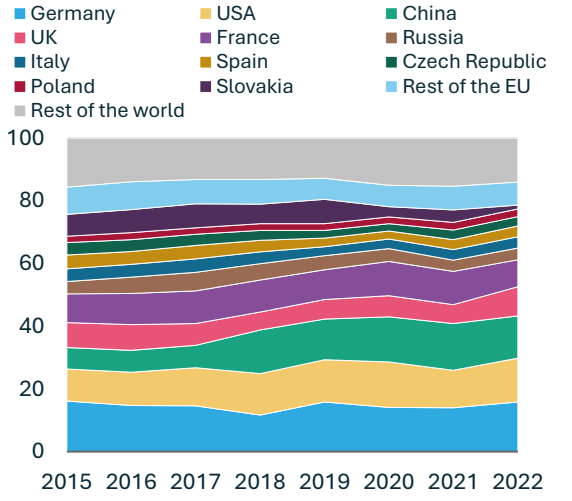
While car spending is rising in the new EU member states, demand for cars in Western Europe has declined since the pandemic. The new member states are gradually converging toward Western Europe in terms of cars per capita, where car registrations have been falling for an extended period. Household car purchases (in constant prices) in the old EU12 had still not caught up to 2019 levels by 2024, lagging by 2 percent. Even more striking are investment purchases of cars, which compared to 2019 fell by 9 percent in France, 12 percent in Germany, 20 percent in the Netherlands, 25 percent in Spain, and as much as 33 percent in Ireland.

WHAT LIES AHEAD

German car manufacturers will continue to lose ground at home and will try to keep up with the competition by increasing efficiency and seeking cooperation with Chinese automakers. The German economy has stagnated since 2019, and future developments will likely be influenced by the loss of competitive advantages and market share to China. Germany may therefore face a decline in industrial production and a shift toward a more service-oriented economy, as has happened in other advanced countries (UK, France). At the same time, Chinese automakers are expected to enter the EU through investments as well, in order to bypass tariff barriers.

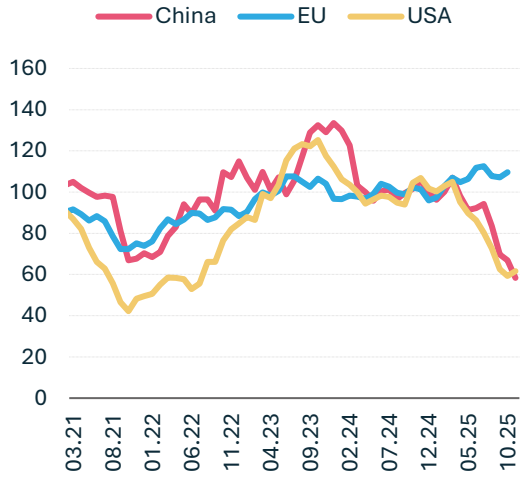
For Slovak production, a key risk is that the Chinese consumer market is nearly as important as the German and American markets (Figure 14). Moreover, the risk of Chinese competition is compounded by rising import tariffs in the USA, which affect Slovak car manufacturers severely (Figure 15). Although only about 8 percent of cars exported from Slovakia went directly to China, compared to 24 percent to Germany, Chinese final demand for Slovak automotive production (or its added value) amounts to roughly 14 percent—comparable to German and American demand. The explanation is that part of our exports to Germany, whether as fully assembled cars or components, is subsequently re-exported, for example to China, which in trade statistics creates the impression of lesser importance.

Figure 14: Demand from China and the USA is equally important for Slovak automakers (share of added value in the Slovak automotive industry, percent)



Source: OECD TiVA, IFP

Figure 15: Slovak exports of cars and components to the USA and China have sharply weakened due to tariffs and Chinese competition (index 100 = 2024, 6m MA)

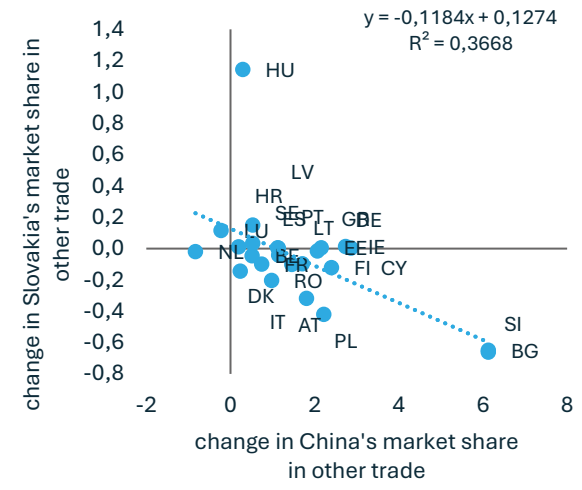


Source: Eurostat, IFP

Since 2019, Slovakia has lost market share in EU markets, precisely in the areas where China has gained. This mainly concerns non-automotive products, where the estimates are fairly reliable (Figure 16). For automotive market shares, the estimates are less precise (Figure 17), but the relationship is equally strong in both categories: a 1 percentage point increase in China's market share leads to a 0.1 percentage point decline in Slovakia's market share. The average Slovak share in EU markets in 2024 was about 1 percent, so losing 0.1 percentage point corresponds to losing 10 percent of the market, which is relatively significant. In the automotive category, however, Slovak market shares in EU countries have increased, which may indicate the resilience of our manufacturers.

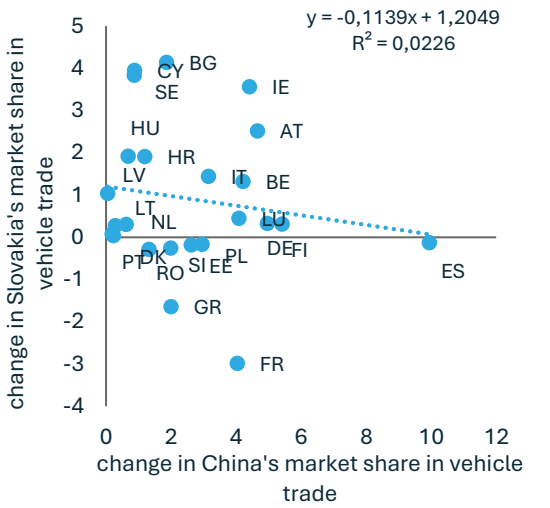
The impact on the Slovak economy does not have to be entirely negative. German automotive groups will seek ways to produce more efficiently to compete with China. This could involve shifting production to the most efficient plants, not only in China but also within the EU, from which Slovakia could benefit. Factories in Slovakia are cost-efficient. However, a significant share of suppliers in Slovakia will be under pressure due to China. Approximately 13 percent of industrial added value and around 6 percent of total economic added value in Slovakia is linked to German demand. These are mainly companies that are part of the supply chains of automakers operating in Slovakia. The scale of this challenge may outweigh the potential benefits from investment relocation to Slovakia. While the ratio of goods exports to services exports in Germany is 3 to 1, in Slovakia it is nearly 8 to 1, by far the highest in the EU.

Figure 16: In non-automotive products, Slovakia is losing European markets to China (change in market share, percentage points)



Source: UN Comtrade, IFP

Figure 17: In car trade, Slovakia maintains its market shares, and the link with China is not robust (change in market share, perc. p.)

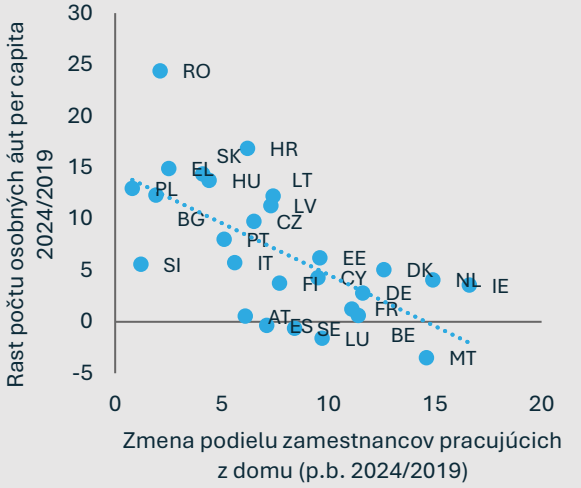


Source: UN Comtrade, IFP

BOX: THE MORE FROM HOME, THE LESS IN THE CAR

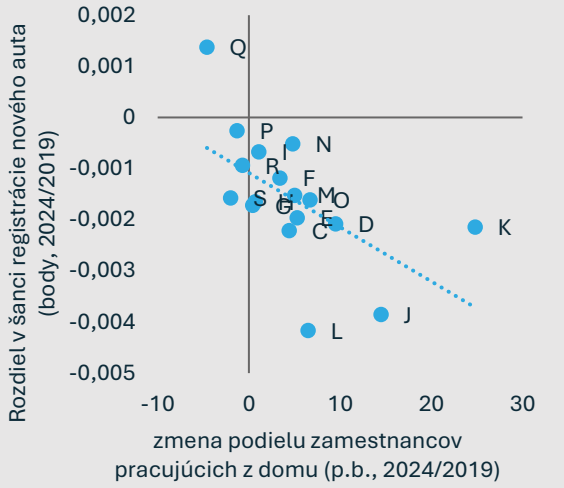
One reason for lower interest in cars may be the increase in working from home. A survey of residents in selected European cities from 2021 suggested that people working from home were more interested in buying a car during the pandemic, even though they reduced its usage(Vega-Gonzalo et al. 2023). However, paradoxically, in countries where working from home increased the most by 2024 (compared to 2019), car ownership grew the slowest. This negative relationship holds even after accounting for growth in disposable income and the pre-pandemic number of cars per capita.[3] In Slovakia, between 2019 and 2024, the pattern was similar: the more a sector increased the share of people working from home (e.g., Sector J: ICT), the fewer new cars were registered by the employees in that sector (Figure 19). Similarly, data from the population census in California show that comparable households working from home own fewer cars than other households. The pandemic further amplified this difference (Schouten, 2025).

Figure 18: In countries with the largest increase in working from home, interest in cars was the lowest



Source: Eurostat, IFP

Figure 19: *In Slovakia, sectors with a higher share of working from home showed lower interest in cars**



Source: VZPS, SP, evidencia vozidiel Policajný zbor SR , IFP
Pozn.: písmená na grafe zobrazujú NACE kód sektorov

[3] To strengthen the causal link between working from home and the growth in the number of cars, we used a 2SLS method, where we instrumented working from home with the 2019 potential for working from home (see Bruegel a *technical teleworkability index* podľa Sostero et al., 2023. A 1 percentage point increase in the share of employees working from home reduced the growth in cars per capita by 1.43 percentage points (p=0.000).

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