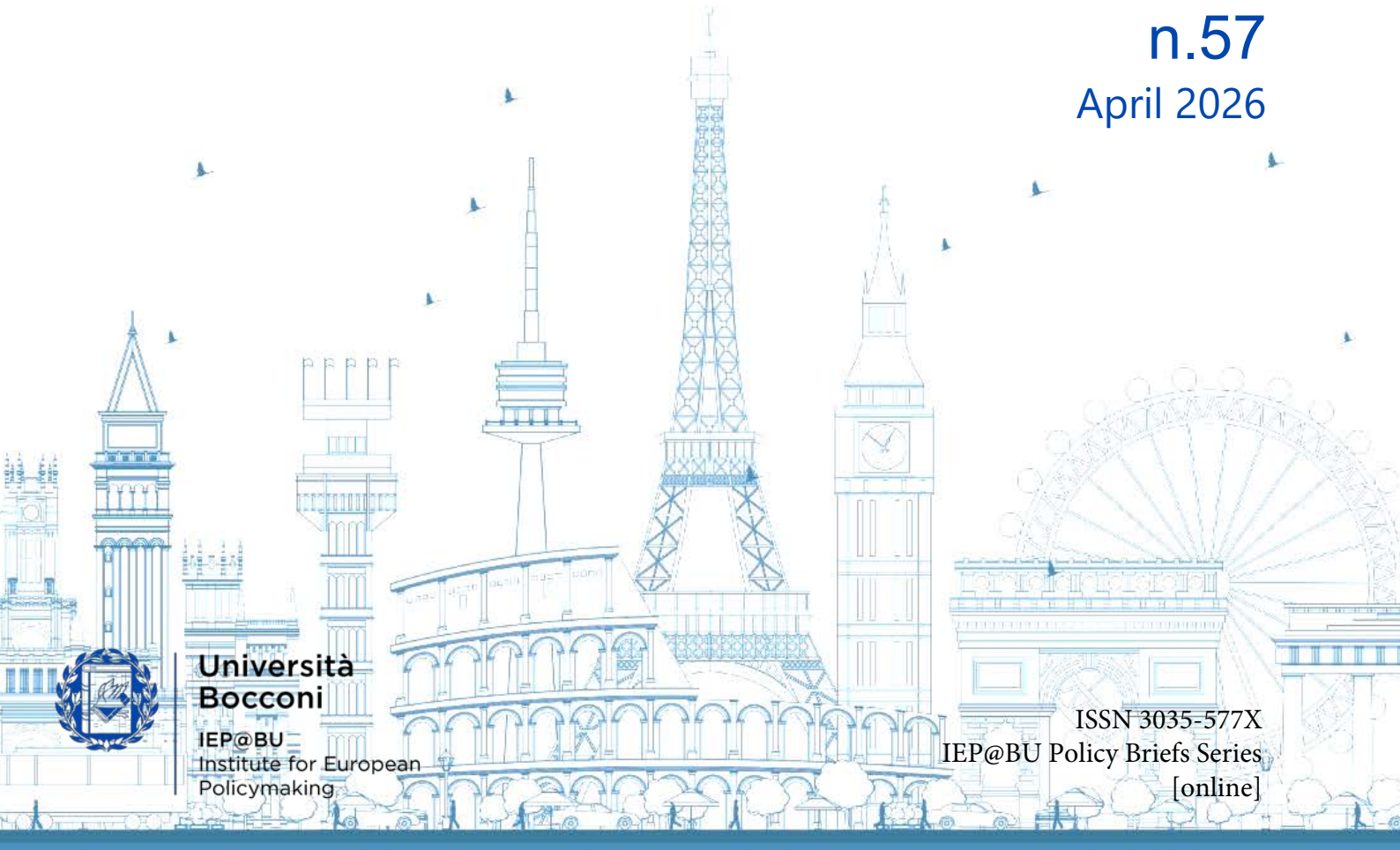
A GROWING GAP?
Eu–China Trade Alignment In High-Tech Manufacturing

THOMAS M. **ROWLEY**

IEP@BU Policy Brief
n.57
April 2026



Università Bocconi
IEP@BU
Institute for European Policymaking

ISSN 3035-577X
IEP@BU Policy Briefs Series
[online]

Executive Summary

The EU's share of global value-added in tech-intensive manufacturing exports has remained resilient, even as China's ascent eroded the shares of the US and Japan.

However, EU exports remain concentrated in increasingly vulnerable mid-tech sectors like autos and machinery, especially in trade with China. Yet Chinese demand has already shifted, becoming a key driver of high-tech import growth.

While the EU maintains strengths in pharmaceuticals and aerospace, it faces a deepening comparative disadvantage in electronics, the sector that now accounts for over half of global high-tech trade and where China leads in imported value added, highlighting a significant missed opportunity for the EU. Furthermore, the electronics that the EU does export align poorly with what China demands.

Amid heightened global trade tensions, Chinese firms are accelerating their push into the EU market, contributing to a rapidly growing bilateral trade deficit in tech that has emerged since 2020. While higher Chinese imports may create leverage for reciprocity, this structural misalignment ensures that even with better market access, EU firms will struggle to benefit from China's tech ascent. Closing this gap is essential for the EU to retain its technological weight and maintain equal footing. This requires a targeted strategy to:

- **Reinforce a broad electronics base:** Accelerate scale-up of key components and intermediates to rebuild competitiveness and expand high value-added electronics exports.
- **Promote collaboration:** Embed EU firms in high-demand, China-linked high-tech supply chains in lower-sensitivity segments where the EU already has a stronger export base.
- **Recalibrate diplomacy:** Link market access to verifiable openings in standards, procurement, and certification.
- **Equip high-tech SMEs:** Provide tailored export finance, compliance coaching, and in-country support to help innovators enter China, while improving links between existing China-based support platforms and Europe's domestic tech clusters.

Implementing these measures will curb strategic dependencies, keep EU–China trade balanced, and secure the EU's long-term competitiveness in high-tech value chains, while fostering mutually beneficial collaboration.

1. The Resilience of EU Tech Exports and China

What you export matters, not only in volume, but in value added.[1] For the EU, this means tech-intensive manufacturing, where its share of global exported value added has held up even as China's rise eroded the relative shares of the United States and Japan.[2] Yet this resilience is increasingly challenged by where growth is occurring. In the decade leading to COVID, global high-tech exports grew modestly while the EU's core mid-tech base stagnated.

The EU's resilience in high-tech owes largely to pharmaceuticals, while exported value added in electronics, which has been the main engine of high-tech export growth globally, peaked in 2008.[3] At the same time, while China has become a key driver of global high-tech import growth, EU exports to China remain disproportionately concentrated in mid-tech, underscoring a significant missed opportunity.

As Chinese firms increasingly identify Europe as a key export market amid ongoing US trade tensions, the EU may have scope to press for more concrete reciprocity.[4] Yet EU export growth has been oriented toward the United States, reinforcing a structural tilt away from China. In particular, the EU's high-tech export mix aligns exceptionally poorly with China's import demand. Even if market access improves, this misalignment will limit EU gains in the sectors where China's demand is growing fastest.

This brief combines UN Comtrade and recently updated OECD Trade in Value Added (TiVA) data to assess the EU's position and structural misalignments in EU–China trade. TiVA's domestic value added (DVA) strips out foreign inputs to show where value is created along global value chains. Figure 1A shows that while high-tech drove nearly all export growth from 2011 to 2020, value-added growth was modest relative to gross exports.

For the EU, post-COVID high-tech export growth has lagged the global average, and exports of value added in mid-tech remained below their 2014 peak by 2022 despite new highs in gross exports.

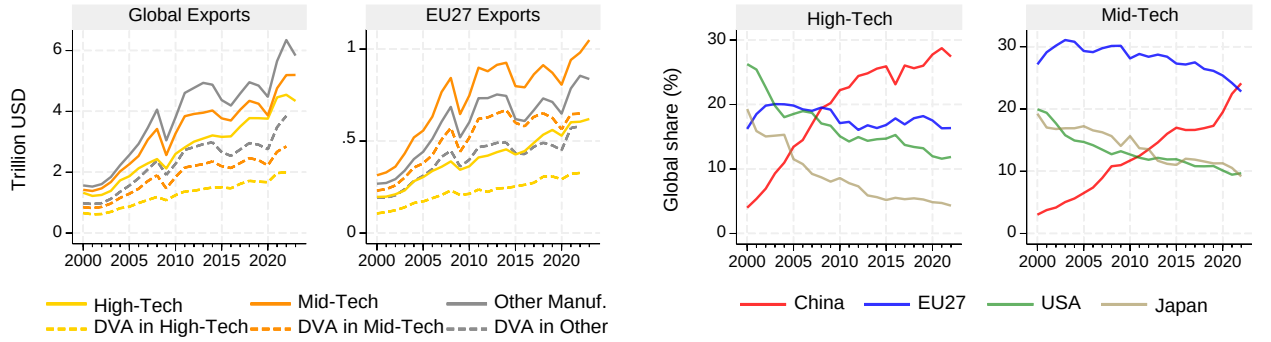
Figure 2 highlights cross-country and cross-sector heterogeneity. In 2022, domestic value added accounted for 83% of EU high-tech gross exports. While China's 76% remains closer to the global figure of 73%, its export scale has lifted its share of global exported value added to nearly 30% (Figure 1B).

Meanwhile, China's post-COVID mid-tech export boom has created fresh pressure on the EU's global export share. Still, Chinese tech exports remain at least as integrated in global value chains as those of the EU, leaving scope for EU firms to benefit from China's export position and its role as the world's second-largest tech importer (Figure A4).

[1] Hausmann, Hwang, and Rodrik (2007) show that exporting more sophisticated goods is associated with faster growth.
[2] 7 of the 17 manufacturing industries in the OECD's TiVA dataset are high-tech or mid-high-tech (shortened to mid-tech here) based on their average R&D intensity, and thus what we label "tech-intensive" or "tech." Table 1 provides details.
[3] In this brief, the EU is fixed to the current 27 members and excludes intra-EU27 trade unless otherwise noted.
[4] An Allianz (2025) survey finds that Chinese firms increasingly target Europe while European firms look to Asia.

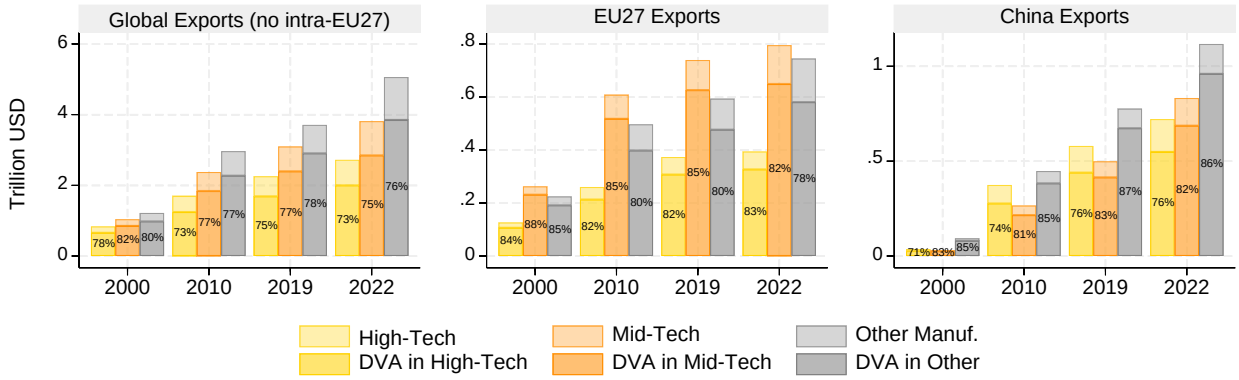
Figure 1. Manufacturing Exports and Tech

Panel A: Global Tech and non-Tech Exports (no intra-EU) Panel B: Share of Value Added in Global Exports



Note: Panel A plots exports of high-tech, mid-tech, and all other manufacturing, excluding intra-EU27 trade. Solid lines show UN Comtrade data, and dashed lines show OECD TiVA domestic value added (DVA). Panel B shows shares of total value added embodied in global exports. ISIC codes 21, 26, and 30 are high-tech; 29, 28, 20, and 27 are mid-tech (see Table 1).

Figure 2. Manufacturing Exports and Tech: Domestic Value Added and Gross Exports



Note: Light bars are gross exports and dark bars are domestic value added (DVA) in gross exports, both are from the OECD's TiVA. The graphs account for all manufacturing exports, divided into high-tech, mid-tech, and all other manufacturing (Non-tech). DVA % of exports is shown. ISIC codes 21, 26, and 30 are high-tech; 29, 28, 20, and 27 are mid-tech (see Table 1).

The analysis proceeds in four steps. First, it uses OECD TiVA data to benchmark EU and Chinese comparative advantages, showing sharp divergence in the most tech-intensive sectors. Second, it compares each partner's share in the other's import basket with its share of world exports to identify where the EU is underrepresented in China's demand mix. The Trade Complementarity Index (TCI) is then used to show that misalignment is deepest in electronics and extends to the broader high-tech category. Finally, it translates these results into sector-specific policy actions.

2. Is the EU Still (relatively) Good at Tech Manufacturing?

After first surpassing the United Kingdom's tech exports in 2001, China quickly moved ahead of South Korea, Japan, the United States, and its only close contender of recent years, the EU27.

Furthermore, OECD TiVA data show a rapid increase in China's tech-sector share of its total exported value added. Table 1 ranks the seven (of seventeen) most R&D-intensive 2-digit manufacturing codes according to the OECD. These accounted for 56% of China's total value added in its manufacturing exports by 2022, up from 39% in 2000, a leap that puts China on par with the global average and closes much of its gap with the EU's 63%.

Table 1. Tech-Intensive Industries' Share of Total Exported Domestic Value Added (DVA)

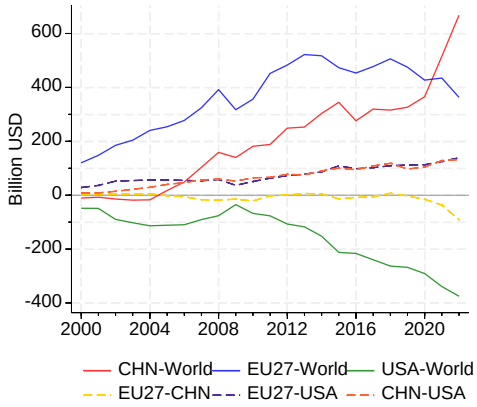
		Industry share (%) of exported DVA							Industry share (%) of all DVA	
		China			EU			World	China	EU
ISIC 2-digit industry (code: name)	R&D % of VA	2000	2010	2022	2000	2010	2022	2022	2022	2022
21: Pharmaceuticals	28.0	0.91	0.84	0.78	4.99	6.65	10.6	4.23	2.95	9.20
26: Computers, electronics and optical	24.1	16.7	26.5	21.9	11.9	7.81	6.23	15.0	7.88	5.00
30: Other transport (water, trains, air)	20.4	2.25	4.29	2.31	3.21	4.43	4.71	3.74	1.24	2.62
29: Motor vehicles and trailers	15.4	1.81	2.81	4.67	14.8	15.1	12.8	8.51	5.81	10.7
28: Machinery and equipment	7.89	4.53	8.36	8.52	14.3	16.0	13.5	8.89	8.72	10.3
20: Chemicals and chemical products	6.52	5.17	5.70	8.38	8.46	8.25	9.58	9.88	7.61	7.44
27: Electrical equipment	6.22	7.95	7.76	9.71	6.17	6.60	5.76	9.63	5.23	4.72
Sum	**-**	**39.3**	**56.3**	**56.3**	**63.8**	**64.7**	**63.2**	**59.9**	**39.4**	**50.0**

Note: OECD TiVA is at the ISIC 2-digit level, with 7 of 17 manufacturing industries considered high-tech and mid-tech according to the OECD (2016) R&D intensities. Shares are an industry's % of all manufacturing industries. ISIC 21 and 26 are high-tech; 29, 28, 20 and 27 are mid-tech. ISIC 30 is also treated as high-tech because sub-sector 303 Aerospace with R&D % of GVA 31.7% dominates.

Yet the convergence in overall tech intensity masks substantial differences in export composition. The EU's "tech basket" remains anchored in established mid-tech industries: motor vehicles (ISIC 29), machinery and equipment (28), chemicals (20), and electrical equipment (27) together account for about 42% of the EU's exported manufacturing domestic value added in 2022, while pharmaceuticals (21), computers/electronics/optical products (26; "electronics" for short), and other transport (30; largely aerospace) contribute a further 22%.

China's mix is tilted more toward high-tech, with the three high-tech industries making up about 25% of exported value added in 2022 (down from a 29% peak in 2020), dominated by electronics, the single largest high-tech category globally. Unsurprisingly, China also drives global demand for electronics, importing twice as much value added as the EU (see panel B of Figure A3).

Figure 3. Value Added Trade Balances in Tech



Note: Lines plot trends in tech trade balances aggregating ISIC codes 21, 26, 30, 29, 28, 20, and 27 (see Table 1).

While both economies had a tech surplus of roughly USD 400 billion in 2020, China's trade surplus shot up in 2021 and 2022, surpassing USD 600 billion. However, the tech trade surplus is more strategically important for the EU, representing 80% of its manufacturing value added surplus, compared to just 48% for China, while the EU's surplus has also trended down since 2012.

Comparative Advantage

To gain a clearer picture of the EU's and China's relative strengths in key tech sectors, we estimate Revealed Comparative Advantage (RCA) à la Costinot et al. (2012) but using domestic value added in exports.[5] The RCA index helps reveal structural shifts in relative competitiveness that are less visible in raw trade flows and can offer insight into where the EU's tech strengths complement or conflict with China's growing dominance.

Figure 4 plots annual RCA for the EU27, China, and the US for seven 2-digit tech industries. RCA > 1 indicates comparative advantage and RCA < 1 comparative disadvantage.

Among the four most tech-intensive sectors (in terms of R&D), the EU and China show opposite patterns of RCA: the EU is strong in pharmaceuticals (21), other transport (30), and motor vehicles (29) while China is strong in electronics (26)[6]. These sectoral divergences are complementary if they

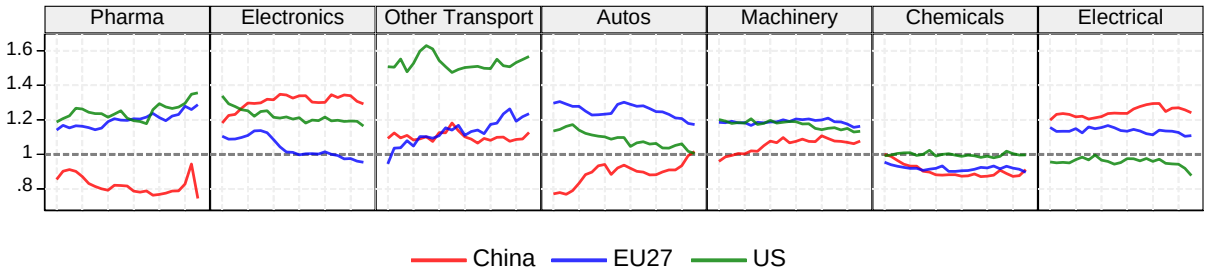
[5] The technique backs out exporter-industry productivity estimates from a fixed-effects regression that controls for bilateral trade costs and linkages. These industry productivities are then converted to an RCA measure similar to Balassa (1965). While the original measure was the ratio of an industry's share in that economy's exports to its share in world exports, this newer method instead compares underlying industry-level productivities across countries.

[6] China's global share of vehicles (29) exports increased rapidly from 2020 to 2024, from around 4.5% to 10%. Still, vehicles are not China's primary export relative to the rest of the world, and the sector remains a comparative disadvantage at the 2-digit industry code level.

support inter-industry trade but could also be a significant hurdle for intra-industry trade. For example, while China is a top exporter in electronics, it is also a top importer of intermediates supplied by other economies that have a similar comparative advantage.

In contrast, the EU27 and China display relatively similar patterns and trends in comparative advantage across the remaining three mid-tech sectors besides motor vehicles. Both have a comparative disadvantage in *chemicals and chemical products* (20), while both have comparative advantages in *electrical equipment* (27), and *machinery and equipment* (28). These overlapping specializations suggest areas of alignment in industrial structure that could support more balanced and mutually beneficial trade based on GVCs. The next section details where the EU–China trade relationship is strong and how this compares to these RCA patterns.

Figure 4. Trends in Tech Industries' Revealed Comparative Advantage (RCA), 2000–2022



Note: Lines plot Revealed Comparative Advantage (RCA) from 2000 to 2022 (year labels omitted), estimated à la Costinot et al. (2012) using domestic value added in gross exports from OECD TiVA (see footnote 5). RCA > 1 implies comparative advantage.

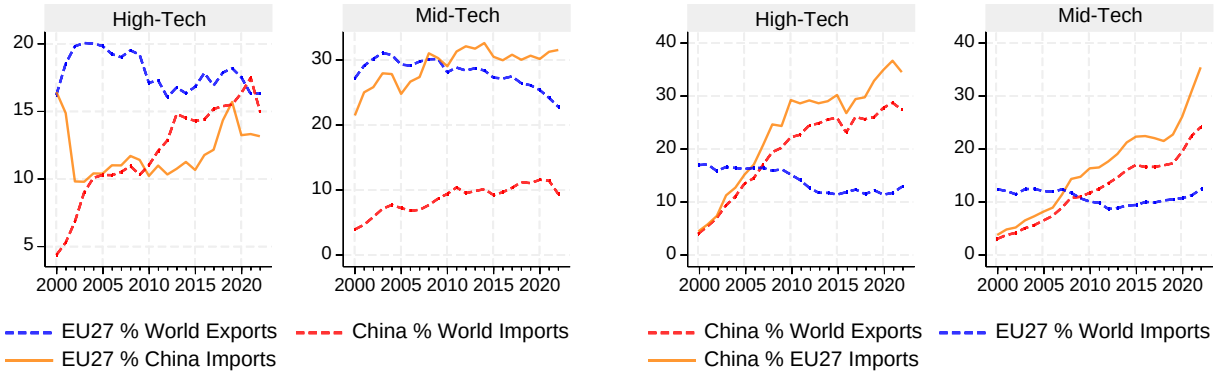
3. The Challenge for EU Exports to China

EU high-tech exports to China continue to underperform. Figure 5A shows that since China entered the WTO, the EU's share of China's imports of value added in high-tech (orange line) has consistently fallen short of its global share (dashed blue). As of 2022, the EU accounted for 16% of global high-tech exports but only 13% of China's high-tech imports. Figure A5 of the appendix confirms that only East and Southeast Asian economies capture a greater than proportionate share of China's high-tech import demand. This is not true when looking at mid-tech, where the EU supplied 23% of global exports but an outsized 32% of China's imports.[7]

[7] These patterns are slightly stronger if vehicles (29) is also included in high-tech.

Figure 5. EU Representation in Global and Chinese High- and Mid-Tech Imports

Panel A: EU Share of World and China's Tech Imports Panel B: China Share of World and EU Tech Imports



Note: Panel A shows the EU's share of global high-tech and mid-tech exports (blue), the EU's share of China's imports (orange), and China's share of world imports (red), using OECD TiVA's domestic value added in gross exports. Panel B presents complementary indicators for China as exporter. ISIC codes 21, 26, and 30 are high-tech; 29, 28, 20, and 27 are mid-tech (see Table 1).

Yet China absorbs 15% of global high-tech imports (down from 17.5% in 2021) versus just 9.4% for mid-tech. Closing this high-tech gap is therefore critical if the EU is to capture more of China's demand and preserve its technological edge. Meanwhile, China is increasingly over-represented in both the EU's high-tech and mid-tech imports (Figure 5B).

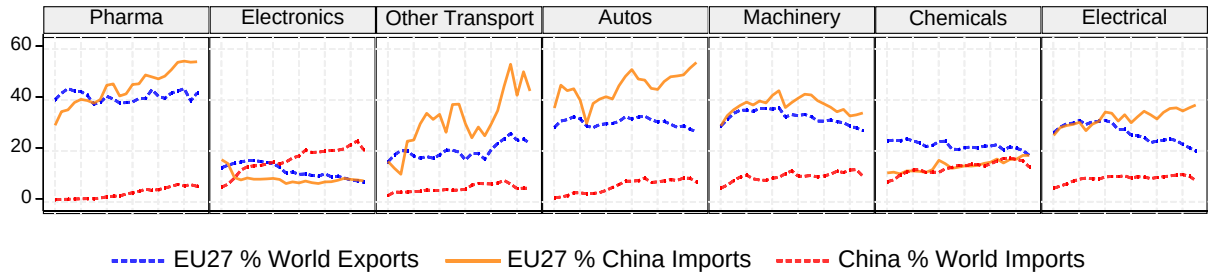
Figure 6A shows that, taken individually, no EU high-tech industry significantly underperforms in its exports to China relative to that industry's global export share. Policymakers may therefore overlook Europe's aggregate shortfall in China if they focus only on single industries. Yet China imports most in the sectors where the EU is weakest and least where the EU is strongest. This creates an aggregation paradox. In the large electronics (26) sector, Chinese imports absorb more than 20% of global trade in value added (Figure 6A).[8]

Unfortunately, this is the sector where the EU has a deepening comparative disadvantage (Figure 4). Meanwhile China's imports of pharmaceuticals (21) and other transport (30), the EU's core high-tech strengths, remain low. Recognizing this mismatch is critical for identifying where future trade opportunities may lie, and for better aligning EU export capabilities with the ongoing reorientation of global demand patterns.

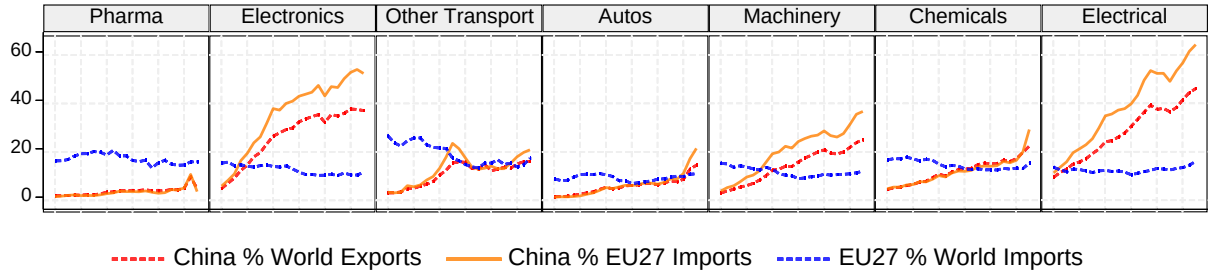
[8] This 20% figure includes China's own exports in the global total.

Figure 6. EU Representation in Global and Chinese High- and Mid-Tech Imports by Industry, 2000–2022

Panel A: EU Share by Industry in World Exports and in China's Tech Imports



Panel B: China Share by Industry in World Exports and in EU Tech Imports



Note: The graphs extend Figure 5A (top) and Figure 5B (bottom) for the 7 tech industries. Annual trends from 2000 to 2022 (labels omitted). The two-digit codes from the left: 21, 26, 30, 29, 28, 20, and 27 (see Table 1).

This asymmetry has strategic implications that have rapidly intensified since 2020, as shown by China's rising share of EU imports across mid-tech sectors (Figure 6B) and the EU's sudden bilateral trade deficit in tech with China (Figure 3). With EU exports to China concentrated in mid-tech sectors where China is increasingly self-sufficient and competitive, the EU currently lacks the export weight in China's most dynamic import segments to negotiate on equal footing. Building a stronger high-tech export presence oriented toward China is therefore not only an economic priority but a precondition for a more balanced bilateral relationship.

To address whether China can be a market the EU leverages to strengthen its high-tech competitiveness, particularly in electronics, the next section looks beyond the bilateral numbers to compare the overall structure of EU exports with China's global import profile.

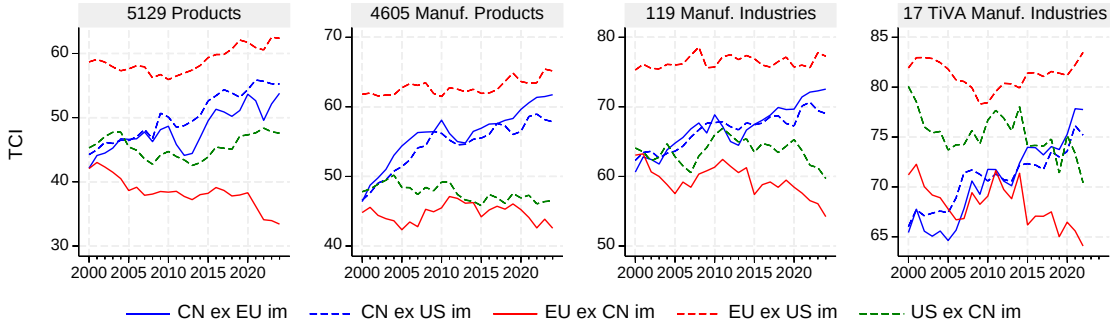
4. EU–China Trade Complementarity

It is helpful to step back from bilateral flows and examine broader patterns in EU export supply and China's import demand. This perspective helps isolate underlying trade potential and assess whether the EU is structurally positioned to meet China's evolving demand, even if that potential is not yet fully realized in direct trade flows as was noted above.

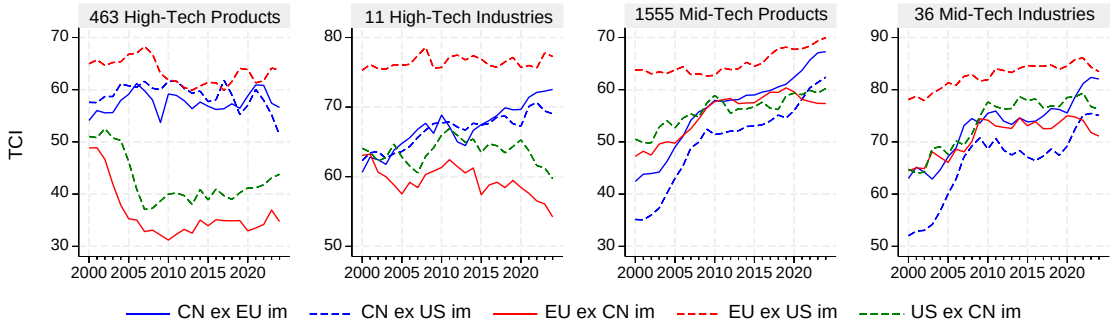
To do so, we use disaggregated UN Comtrade data to compute the Trade Complementarity Index (TCI), which measures how well one country's export profile aligns with another's import profile[9]. The index ranges from 0 (no complementarity) to 100 (perfect complementarity), with higher values indicating a stronger structural fit between exporter supply and importer demand.[10]

Figure 7. Trade Complementarity Indexes (TCI): Alignment from Products to Industries

Panel A: Trade Complementarity Indexes, from Products to Industries



Panel B: Trade Complementarity Indexes, High-Tech vs. Mid-Tech from Products to Industries



Note: Panel A plots TCI values for five country pairings at four aggregation levels: 5,129 HS-6 codes, the 4,605-code manufacturing subset, 119 ISIC Rev. 3 manufacturing industries, and 17 OECD TiVA manufacturing sectors. Panel B repeats for high-tech and mid-tech subsets. All but the 17 TiVA sectors use UN Comtrade data. Higher TCI means A's exports match B's imports (see footnote 10).

Since 2000, China's export mix has steadily converged with the EU's import demand, while the EU's export mix has increasingly diverged from China's import demand (Figure 7). In other words, China has structurally positioned itself to serve EU markets, whereas the EU has not made equivalent adjustments to align with Chinese demand.

[9] In the Comtrade data, the EU export shares (2023) and number of HS codes by ISIC industry are Aircraft and Space (3.7%, 22), Pharma (11.2%, 91), and Electronics (10.0%, 350) for high-tech sectors, and Autos (12.0%, 55), Machinery (12.9%, 477 products), Chemicals (8.8%, 793), Electrical (5.6%, 187), and Other Transport (0.4%, 43) for mid-tech sectors.

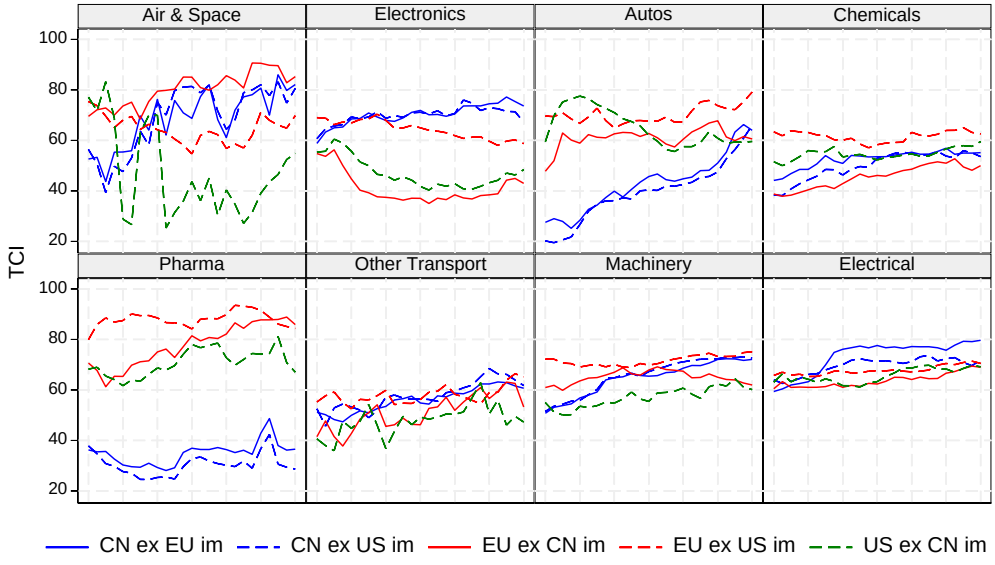
[10] The formula is $TCI_{A\to B} = 100 \times \left(1 - \frac{1}{2}\sum_k \left|\frac{m_{Bk}}{M_B} - \frac{x_{Ak}}{X_A}\right|\right)$ where m_{Bk} are the values of product or industry k (depending on the level of aggregation) in country B's imports, m_B is country B's total imports, x_{Ak} are the values of product or industry k in country A's exports, x_A is country A's total exports. This symmetric formulation abstracts from bilateral flows and provides a structural view of aggregate supply-demand fit. There are two indexes per AB pair.

Although China's import appetite has grown, it increasingly targets goods the EU does not supply, which instead align more and more with US import demand (dashed red lines in Figure 7).[11]

Figure 7A shows that this divergence not only holds at the product level across 5,129 6-digit HS codes and the 4,605 codes that make up the manufacturing sector, but also across aggregated industries, suggesting the issue is systemic rather than incidental. Still, there is scope for the EU to reconfigure its export structure toward China, as even the US export mix aligns more closely with China's current import profile. Rather than a static imbalance, this divergence offers a roadmap for policy intervention, signaling which sectors require greater strategic focus to strengthen the EU's export position in China's evolving tech markets and GVCs. Figure 7B shows that the high-tech sector is a major contributor to this divergence, where we notice a similar pattern (if not more dramatic) to that in Figure 5A from around the time China joined the WTO.

It is not that TCI values need to be equal in both directions, but given China's weight as a high-tech importer, the EU's relatively low TCI in this relationship is notable. Figure A6 of the appendix shows that asymmetry is common. For example, US high-tech exports are more oriented toward EU demand than the reverse, the EU more toward Japanese demand, and South Korea and Japan more toward Chinese demand than vice versa.

Figure 8. Trade Complementarity Indexes, Product Level within Sectors, 2000–2024



Note: Reproduces TCI trends from 2000 to 2024 (labels omitted) at the 6-digit HS product level for 8 high-tech and mid-tech industries (see Figure 7). Based on gross exports from UN Comtrade (see footnote 9 and 10).

[11] In Appendix 2 of this brief, we show that the EU's alignment with US demand does not owe to any single EU partner.

Yet the EU–China TCI stands out as uniquely asymmetric, leaving the EU poorly positioned to capitalize on Chinese high-tech demand despite China's centrality in global trade.

Figure 8 shows that this high-tech misalignment largely comes from the electronics industry. More specifically, EU electronics exports do not match what China imports. Given the EU's comparative disadvantage in this sector, improving alignment with China may require targeted industrial strategies. Yet the size of this sector warrants effort. In recent years, it has consistently accounted for over 30% of China's total manufacturing imports and is still one of the EU's top export sectors to China despite the low fit overall.

While integrated circuits alone accounted for over half of China's electronics imports, there was also a quarter-trillion USD of imports in 2024 in other areas of this broad sector, including telecom and transmission equipment, computing sub-systems and parts, and non-frontier components and equipment. However, even in some of these segments with high Chinese demand and where the EU exports relatively more, Table A1 in the appendix shows that its share of Chinese imports remains low.

The EU cannot afford to see its position in this sector diminish, whether in chips or in the broader electronics supply chain.

Notably, the EU–China TCI sees improvement when integrated circuits are excluded, suggesting there is scope to increase collaboration in these other segments to help expand the EU's electronics ecosystem while it rebuilds competitiveness in the most sensitive parts of the chip value chain.

In contrast to high-tech, there are strong signs of mutual complementarity in the aggregate mid-tech sector that includes autos, rail, chemicals, machinery, and electrical equipment. This held steady from 2008 to 2020, reflecting similar patterns in industry RCA discussed above, and attesting to similar comparative advantages lying behind sustainable trade flows. However, since 2020, divergences in mid-tech have begun, with Chinese export complementarity with both EU and US auto imports surging.

5. Policy Recommendations

Has the EU reached peak China, or can its trade integration find new life? The evidence suggests that while the EU maintains a strong position in global tech trade, its high-tech export relationship with China has not kept pace with China's rise. The EU's structural export strengths are increasingly out of step with China's growing import needs, especially in electronics. This divergence reflects both a missed opportunity and a call to action.

The challenge is less about capacity than alignment. The EU's comparative advantages remain intact across several tech sectors, yet these are not necessarily the areas where China is expanding its imports fastest. Motor vehicles and machinery lead EU sales to China, but these are legacy sectors and exposed to reversals in comparative advantage. Meanwhile, the EU's comparative disadvantage is deepening in both electronics and chemicals, which are the two tech sectors that together make up nearly half of China's manufacturing imports.

The result is a widening mismatch between Europe's most tech-intensive exports and China's most tech-intensive imports. This is even more pronounced than that of the United States and China. The data additionally suggest that simple adjustments to the EU's product mix will not be enough to close

this gap. Instead, improving high-tech trade with China will require targeted strategies at the industry and subindustry levels. **Four priorities emerge.**

First, reinforce Europe's electronics base. The EU would benefit from ensuring a robust industrial base in this sector, with strengthened capabilities precisely where China's import demand is concentrated. China aside, electronics is driving growth in global tech trade, so the EU must move beyond legacy strengths and adapt its industry to emerging trends. Crucially, it is not only the most advanced or fashionable products that deserve attention, but also the components and intermediates that enable higher value-added activity and robust supply chains. This would strengthen Europe's long-run position in GVCs and provide a stronger ecosystem for rebuilding competitiveness in key strategic areas such as advanced integrated circuits.

Second, promote EU–China collaboration in high-demand, lower-sensitivity high-tech segments. The EU can leverage China's reliance on the EU as a key destination for high-tech exports, particularly in electronics and closely related sectors, to embed EU firms in Chinese supply chains for mutual benefit. As discussed above, the EU can immediately focus on electronics segments beyond advanced integrated circuits, where trade complementarity is stronger. Moreover, recent developments in US policy at the time of writing have shown that the definition of what is sensitive trade may be shrinking.

Third, recalibrate trade diplomacy toward reciprocity for access. EU participation in Chinese supply chains and consumer markets requires verifiable openings in standards, procurement, and certification. EU–China collaboration may offer room to encourage more reciprocal flows, and increase productivity in both regions.

Fourth, equip high-tech SMEs for China. Tailored export finance, compliance coaching, and in-country support would let Europe's smaller innovators enter the market without disproportionate cost or risk.

While the first priority extends beyond the bilateral EU–China relationship and demands broad EU resolve, it is also an essential component of the three China-specific priorities. The next step is to give these priorities a dedicated vehicle, which is currently lacking, and to address the rapid, sector-specific obstacles now facing the EU's tech-intensive exporters.

A standing framework is needed to tackle standards alignment, licensing delays, supply-chain bottlenecks, and SME market entry across high-tech industries, with clear benchmarks to translate calls for reciprocity into verifiable gains. Existing EU platforms in China, such as the EU Chamber of Commerce, the EU SME Centre, the China IP SME Helpdesk, and Horizon Europe liaison offices, should feed into SME support and intellectual property workstreams, providing real-time feedback from the ground and better linking those networks to Europe's tech clusters. This would give EU tech firms a more predictable foothold in China's fastest-growing import segments and create more opportunities for mutual collaboration.

If post-COVID trade data hint at a peak in EU high-tech exports to China, these four actions offer a path beyond it. By reinforcing domestic capacity, embedding firms where Chinese demand is growing, negotiating reciprocity, and equipping SMEs for the Chinese market, the EU can build a more sustainable trade relationship with the world's second-largest tech importer. This is essential to preserving the EU's competitive edge in global tech trade.

References

Allianz.com. “Allianz | Allianz Trade Global Survey 2025: Trade War, Trade Deals and Their Impacts on Companies.” https://www.allianz.com/en/economic_research/insights/publications/specials_fmo/250520-global-trade-survey.html.

Costinot, A., Donaldson, D., and Komunjer, I. (2012). “What Goods Do Countries Trade? A Quantitative Exploration of Ricardo’s Ideas.” *The Review of Economic Studies*, 79(2): 581–608. https://doi.org/10.1093/restud/rdr033.

Hausmann, Ricardo, Jason Hwang, and Dani Rodrik. (2007). “What You Export Matters.” *Journal of Economic Growth* 12, no. 1: 1–25. https://doi.org/10.1007/s10887-006-9009-4.

“OECD Trade in Value Added (TiVA) 2023 Edition: Principal Indicators, Levels.” http://oecd.org/en/topics/sub-issues/trade-in-value-added.html.

“OECD Taxonomy of Economic Activities Based on R&D Intensity.” OECD Science, Technology and Industry Working Papers. Vol. 2016/04. OECD Science, Technology and Industry Working Papers, July 16, 2016. https://doi.org/10.1787/5jlv73sqqp8r-en.

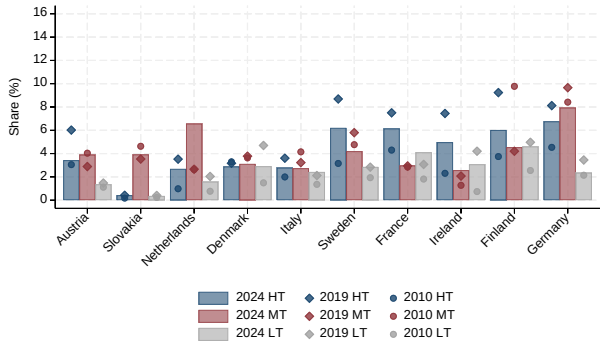
Appendix

Appendix 1. EU Countries Tech Exports to China

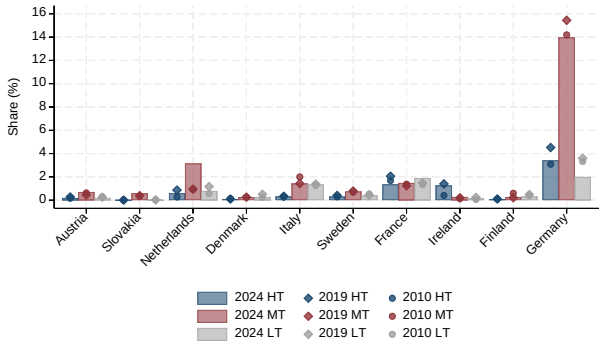
At the country level, EU member states are relatively intensive in intra-EU trade. This may make it seem as if exposure to China is not as high as when looking at extra-EU trade. When including intra-EU trade, member states with the greatest share of their manufacturing exports going to China in 2024 were Germany at 6.1%, Finland at 4.7%, Ireland at 4.3% and France at 4.2%. However, Germany was more reliant on exports to China for mid-tech manufacturing, at 7.94% of these exports, and slightly more reliant for high-tech at 6.8%. Notably, Germany relies very little on Chinese demand for its mid-low or low-tech manufacturing exports, with only 2.35% of these going to China.

Figure A1. EU Countries Trade Shares with China

Panel A: Shares of Total Tech Exports to China



Panel B: Share of Total Chinese Tech Imports



Note: Includes the 10 EU countries with the highest share of their manufacturing exports going to China in 2024 (most China-reliant on the right). Panel A reports these shares by tech level: high-tech, mid-tech, and low-tech (all other "non-tech" manufacturing). Panel B shows the share of China's imports accounted for by each country. Based on UN Comtrade data. Includes intra-EU trade.

The figure shows that there has been a post-COVID pullback in reliance on China as an export destination for high-tech manufacturing among all 10 most China-dependent EU exporters. Mid-tech is more mixed, with some increasing their share of exports to China and some decreasing. At the same time, China remains relatively reliant on German mid-tech, accounting for 14% of its total mid-tech imports in 2024, though decreasing from previous years. There has, however, been some pullback from German low-tech exports. Meanwhile, other EU member states represent much lower shares of China's total imports.

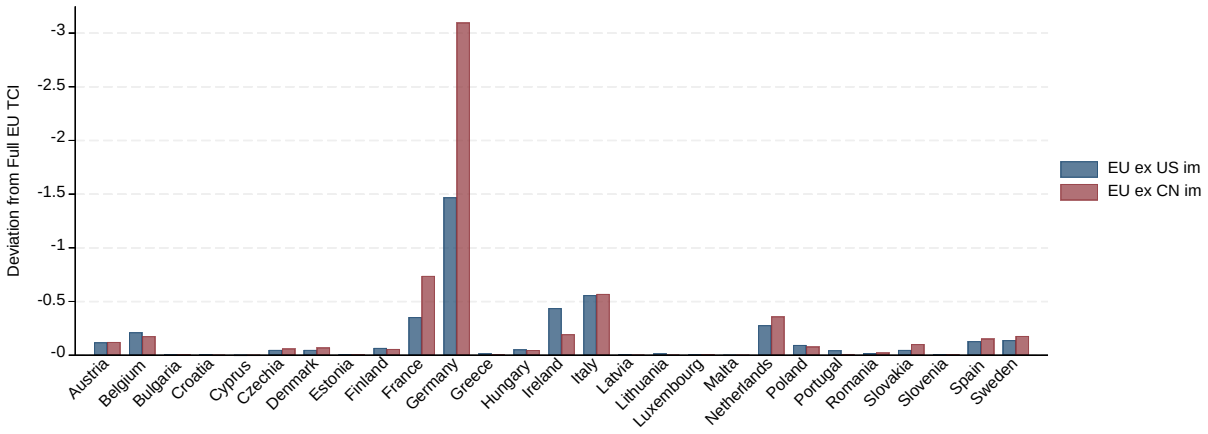
Appendix 2. National Drivers of EU–China and EU–US Trade Complementarity

Some EU member states are more deeply integrated into transatlantic trade and global value chains involving US multinationals than others. The same applies to trade with China. This box examines how the Trade Complementarity Index (TCI) for EU exports to US and Chinese imports changes when bilateral trade with individual EU countries is excluded. In each case, one member state's exports are removed from total extra-EU exports and, symmetrically, US or Chinese imports from that country are removed from the partner's import basket.

By construction, this exclusion systematically lowers the TCI, as it reduces the degree of overlap between the EU's export structure and the import profiles of the US or China. The figure below shows the change in 2023 TCI at the aggregation of 119 ISIC manufacturing industries when removing EU member states. In 2023, the full TCI stood at 77.6 for EU to US trade and 56.4 for EU to China trade. Removing Germany caused the largest drop in both cases. For the EU–US case, Italy and Ireland follow.

While Ireland hosts many US multinationals that may align strongly with US import demand, much of that activity is in services, so the impact on goods trade is limited. Overall, complementarity with the US remains high even when individual member states are excluded. This holds at the sector level as well (not shown): for example, the EU–US TCI in pharmaceuticals decreases only slightly from 83.9 to 82.3, and in chemicals from 63.4 to 61.1, when trade with Ireland is removed.

Figure A2. Change in 2023 TCI when removing EU Members

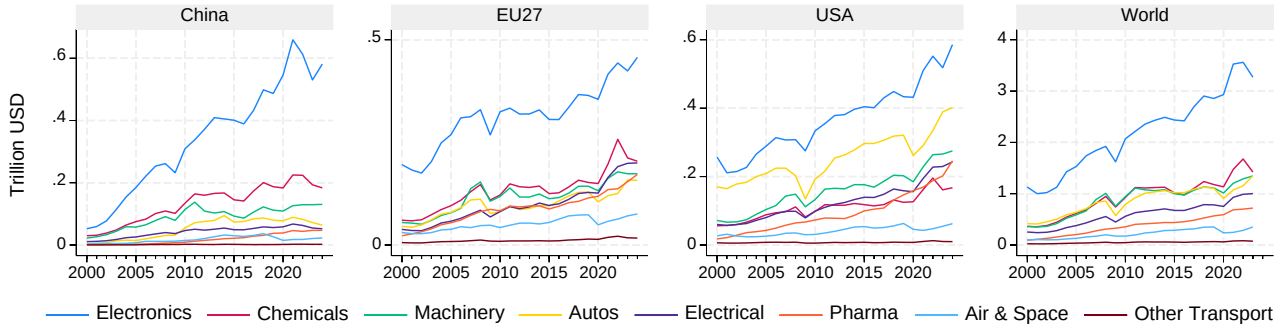


Note: Change in TCI computed across 119 ISIC manufacturing industries when removing trade flows country-by-country

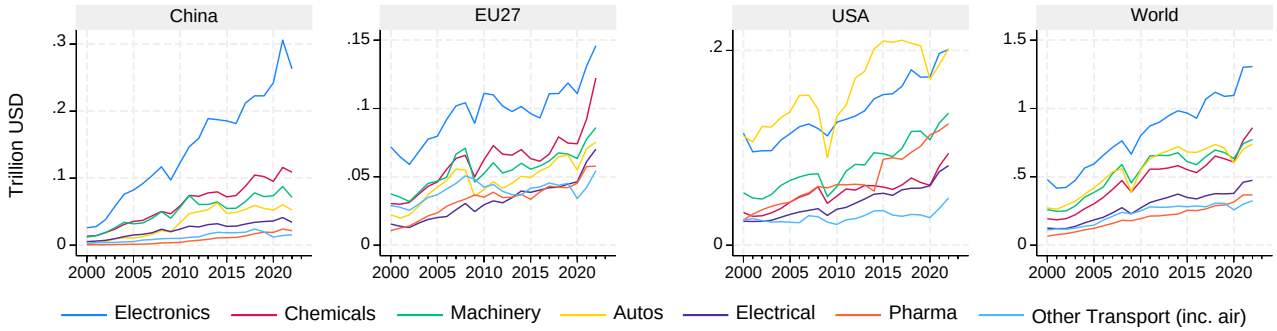
Additional Figures and Tables

Figure A3. Tech Manufacturing Imports and Exports Industry Trends, Nominal and Value Added

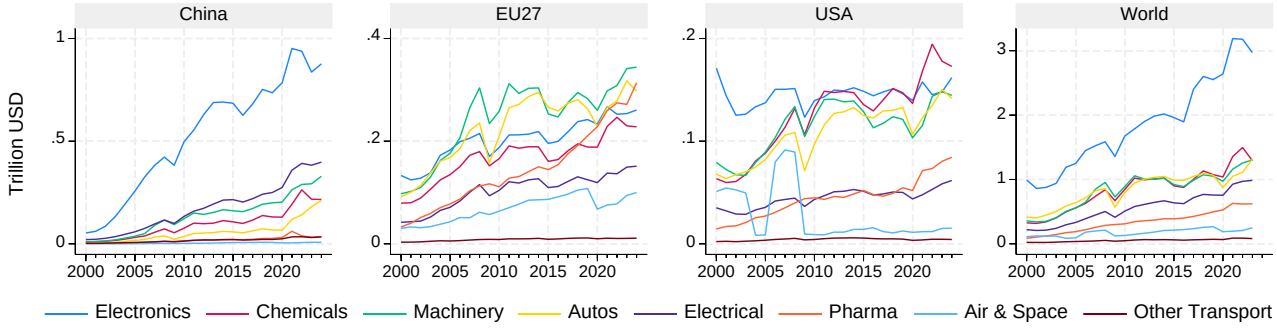
Panel A: Imports, 2000–2024



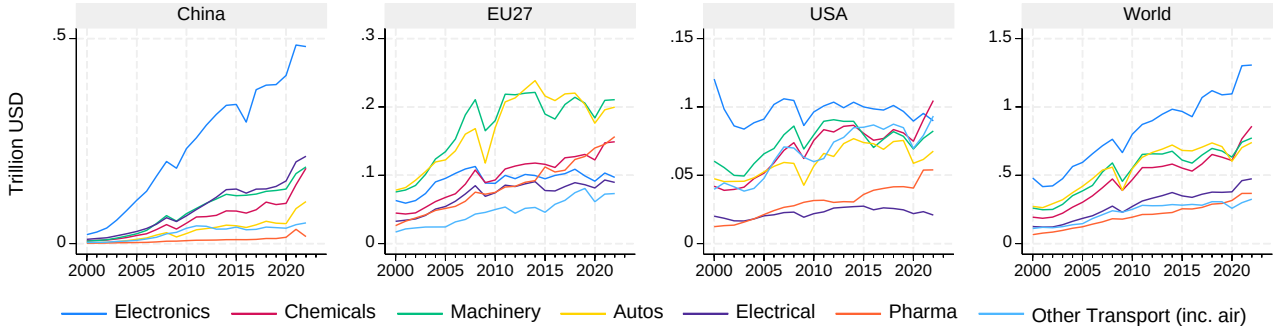
Panel B: Other Countries' Domestic Value Added in Gross Imports, 2000–2022



Panel C: Exports, 2000–2024



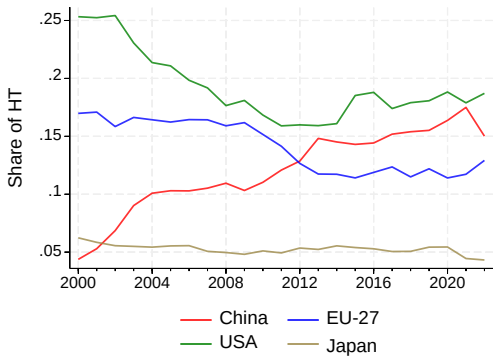
Panel D: Domestic Value Added in Gross Exports, 2000–2022



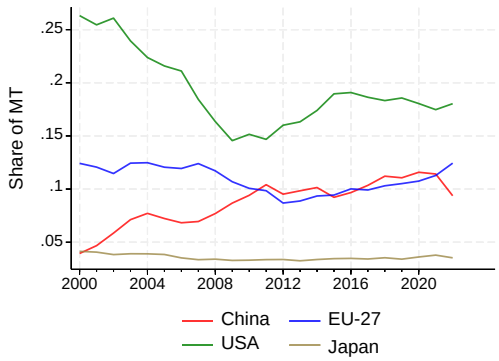
Note: Imports and Exports from UN Comtrade, domestic value added from the OECD's TiVA. At the time of writing, some major reporting economies (e.g., Indonesia) had not yet reported 2024 data in the UN Comtrade database.

Figure A4. Leaders in Import Demand for Tech-intensive Manufacturing

Panel A: Shares of Global High-Tech Imports



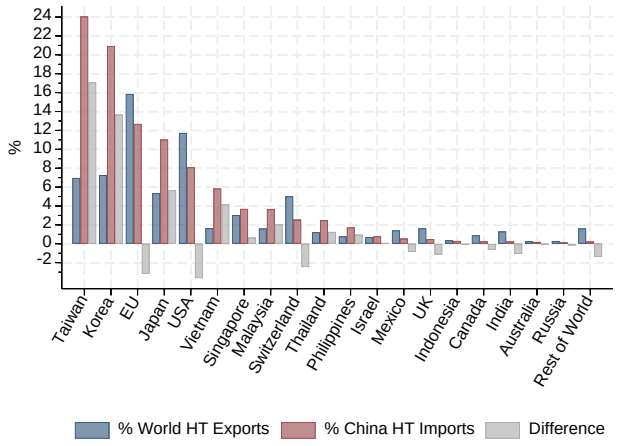
Panel B: Shares of Global Mid-Tech Imports



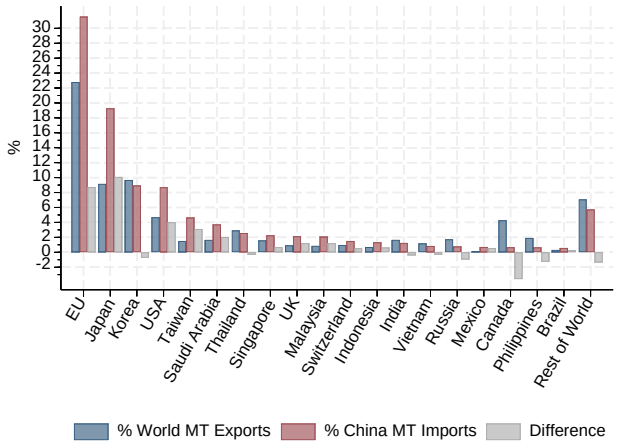
Note: Shown are the shares of value added in global imports in tech-intensive manufacturing industries. Data for both graphs come from the same source as Figure 1B, except summing within importing partners to obtain global shares.

Figure A5. Representation in Global and Chinese High- and Mid-Tech Imports in 2022

Panel A: High-Tech Sector

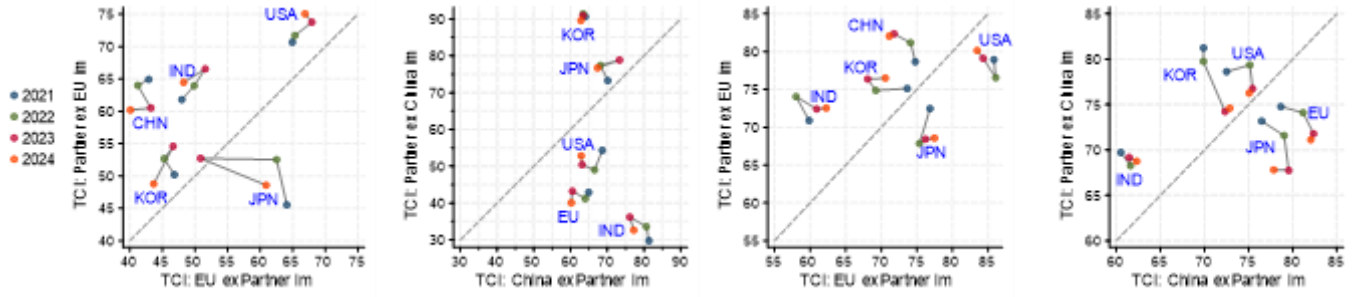


Panel B: Mid-Tech Sector



Note: Reproduces the metrics in Figure 5A for China's largest trade partners in the year 2022, using OECD TiVA domestic value added (DVA) in gross exports. Panel A shows each partner's share of global high-tech exports (blue), their share of China's imports (red), and the difference (gray), where a positive value indicates that the partner relies on China for its imports relatively heavily. Panel B repeats for mid-tech. High-tech industries are ISIC Rev. 4 codes 21, 26, 30 and mid-tech industries (right) are 29, 28, 20, and 27 (see Table 1).

Figure A6. Trade Complementarity Indexes (TCI) Symmetries 2021 to 2024 (11 high-tech and 36 mid-tech industries)



(a) EU high-tech (b) China high-tech (c) EU mid-tech (d) China mid-tech

Note: Shows TCIs for select country pairs, with one direction on the X axis and the other direction on the Y axis. A country pair on the 45-degree line implies their export markets (export supply) are equally geared towards each other's import market (import demand). Points off the 45-degree line imply one country's export supply is relatively more oriented to the other's import demand. The TCI here corresponds to the industry level graphs in Figure 7. All use gross exports from UN Comtrade. The 11 high-tech ISIC 4-digit industries include Aircraft, Electronics, Pharma, Medical, and ICT. The 36 mid-tech ISIC 4-digit industries include Machinery, Chemicals, Electrical, Transport, and Weapons. The country codes correspond to China (CHN), the EU, Japan (JPN), South Korea (KOR), and India (IND).

Table A1. 2024 Top-20 EU Exports and Top-20 China Imports in Electronics-Related Products (HS2017), aggregated from relevant 6-digit codes to their 4-digit category

HS4	Description	China imports (USD millions)	Share of China imports in sector	EU exports (USD millions)	Share of EU exports in sector	EU share of China product code imports
8542	Electronic integrated circuits (chips)	329,732	0.568	29,508	0.110	0.021
8517	Telecom equipment (phones, networking gear, and parts)	53,691	0.092	29,154	0.109	0.038
8471	Computers and computer units (processing, storage, peripherals)	45,790	0.079	28,404	0.106	0.020
8473	Parts and accessories for computers/office machines	18,455	0.032	5,531	0.021	0.025
8529	Parts for transmission/camera/monitor/ receiver equipment (8525–8528)	17,677	0.030	3,370	0.013	0.044
8541	Discrete semiconductors (diodes, transistors, LEDs, etc.)	16,603	0.029	7,391	0.028	0.092
9031	Measuring/checking instruments (other)	14,814	0.026	11,980	0.045	0.166
9018	Medical instruments and appliances	11,184	0.019	37,457	0.140	0.226
8532	Electrical capacitors	7,511	0.013	1,234	0.005	0.017
9027	Physical/chemical analysis instruments (lab/analytical equipment)	7,780	0.013	12,923	0.048	0.261
9001	Optical fibre and optical fibre bundles/cables; optical sheets	5,938	0.010	3,152	0.012	0.047
8534	Printed circuits (circuit boards)	5,631	0.010	1,144	0.004	0.047
9032	Automatic regulating/control instruments and apparatus	4,973	0.009	5,418	0.020	0.159
8523	Recorded media (incl. solid-state storage media)	4,754	0.008	4,766	0.018	0.203
9021	Orthopaedic appliances	4,529	0.008	22,557	0.084	0.394
9002	Lenses, prisms, mirrors and other optical elements	3,371	0.006	2,035	0.008	0.050
9022	X-ray and other medical imaging apparatus (incl. parts/accessories)	3,440	0.006	8,722	0.033	0.432
9030	Electrical measuring/checking instruments	3,547	0.006	4,966	0.019	0.211
9026	Instruments for measuring/checking liquids or gases (flow/pressure, etc.)	3,147	0.005	5,911	0.022	0.307
8526	Radar, radio navigation aid, and radio remote-control apparatus	2,336	0.004	4,501	0.017	0.249
8525	Transmission apparatus (and certain cameras, depending on split)	2,110	0.004	5,655	0.021	0.341
8518	Audio equipment (microphones, loudspeakers, headphones, etc.)	1,639	0.003	4,067	0.015	0.214
8528	Monitors/projectors; television receivers	620.2	0.001	5,276	0.020	0.161

Note on Comtrade data for Extra-EU trade statistics

Comtrade reports EU trade as a single trading bloc with the rest of the world, using the contemporaneous membership in each year (e.g., EU28 before 2020, EU27 after Brexit). In this brief, the EU is held fixed at its current 27 members, with statistics calculated for these countries as a single bloc dating back to 2000, well before some of them joined the EU. This approach avoids artificial breaks in the data caused by membership changes when looking at EU–World statistics and better reflects long-term trends for today's EU. The same fixed-membership approach is used in the OECD TiVA dataset.

In Comtrade, the closest predefined group to this is "EU28 - EU members (excl. UK)", but it includes intra-EU trade. Therefore, exports and imports to "World" are adjusted by removing trade flows between "EU28 - EU members (excl. UK)" and itself. The resulting extra-EU figures match Comtrade's contemporaneous EU trade statistics from 2020 onward, when the UK left the EU, apart from a residual difference of 1-3% in those years. For context, intra-EU trade has accounted for roughly 58-59% of total EU trade since 2020.

IEP@BU does not express opinions of its own. The opinions expressed in this publication are those of the authors. Any errors or omissions are the responsibility of the authors.