

12% Lower: Foreign Exports of Manufactures to China by Volume Since 2022

Simon J. Evenett, 7 October 2026

As China's exports rise, its manufactured import volumes have fallen by about an eighth since 2022. The contraction is broad, persistent and uneven, raising questions about reciprocity in global trade.

The scale and breadth of the contraction

The debate over China Shock 2.0 has concentrated on the expansion of Chinese manufactured exports and the implications of China's US\$1.2 trillion trade surplus in 2025. Much less attention has been paid to what manufactures China is buying from the rest of the world. This matters because concerns that foreign firms are losing sales in China are often supported by individual examples rather than systematic evidence. Has the quantity of manufactured goods that China buys from foreign suppliers fallen since 2022, and if so, how widespread has that decline been? The principal contribution of this analysis is to assemble volume-based evidence on these outcomes, essentially shifting the focus away from the total value of Chinese imports that is affected by price changes.

Volume is the appropriate measure for the matter before us because import values reflect both the quantity of goods purchased and the prices paid for them. For current purposes, this analysis constructs monthly volume measures for individual six-digit product categories of manufactured goods and combines them in a Törnqvist index, which gives greater weight to products that account for larger shares of import expenditure. Manufactures are defined as HS chapters 28 to 96 excluding chapter 71. The principal comparison uses January to August in both 2022 and 2026 so that the same months are

compared. The detailed construction of the data and indices is reported in Box 1.¹

Figure 1 provides the starting point. When all imports are considered (manufactured and other), China's total import volume in January to August 2026 remained close to its 2022 level, even though the value of imports in current US dollars was substantially higher. Figure 2 reveals the importance of separating out Chinese imports of manufactured goods from other goods. The volume of manufactured imports in January to August 2026 was 12.3% below the level recorded in the same months of 2022, while the volume of non-manufactured imports increased by about 15%. China has therefore not experienced a comparable contraction in imports across all goods. The principal change has been in the composition of what China buys from abroad, with foreign sales of manufactures falling markedly.

The contraction in manufactures import volume occurred early and persisted. Figure 2 shows that the manufactured import volume index fell sharply between 2022 and 2023. When January to August is compared in each year, the index moved from 100.9 in 2022 to 89.9 in 2023. It then recorded 90.8 in 2024, 90.0 in 2025 and 88.5 in 2026. Roughly nine-tenths of the cumulative fall had therefore occurred by 2023 and the lost ground was not subsequently recovered.

The aggregate decline is not the product of a few exceptional goods. Figure 3 recalculates the manufactured import volume index after removing

goods into one volume measure. I have used such CPB data before but, given our focus here on manufactures, it was necessary to construct a manufacturing-only import volume measure using standard methods.

¹ To the best of my knowledge, there is no off-the-shelf established measure of Chinese import volumes of manufactured goods. The CPB Netherlands Bureau for Economic Policy Analysis produces an import volume index for China for all of its purchases abroad, combining both manufactured and non-manufactured

the 25, 50, 100 and 250 HS6 products that made the largest positive or negative contributions to the change in the aggregate import volume index. Every case shows a substantial decline. Excluding the 25 most influential products produces a larger fall than the headline index shows because several of the largest individual contributions were positive. Figure 4 confirms that the movement is dispersed across many products. The top 25 products account for only 37% of the total absolute movement across product lines, while the top 100 account for 63%. Therefore, the contraction in Chinese manufactured import volumes remains visible even after the most influential products are removed.

Figure 5 provides a different test of breadth by examining the distribution of changes across individual manufactured products. About 67% of the HS6 products in the comparison recorded lower import volumes between January to August 2022 and the same months of 2026. These declining products also represented about two-thirds of the import value. The median change across products was a fall of about 24%. When products are weighted according to their importance in import value, the median fall was about 13%. The difference between the two measures indicates that smaller product lines generally contracted more sharply than larger ones. The decline was therefore widespread, but its severity differed across imported manufactures.

Broad-based reductions do not mean uniform cuts. Figures 3 to 5 establish that the decline extends well beyond a handful of products and affects a large share of China's manufactured imports. They do not imply that every part of manufacturing has moved in the same direction or by the same amount. Some sectors and products have experienced very large contractions, others have changed little, and some have expanded substantially. This variation matters commercially because firms and exporting countries are exposed to different parts of the Chinese market. It also matters for policy because an aggregate decline can coexist with significant areas of continuing foreign opportunity. In short, China's trading partners may view differently its aggregate decline in sourcing manufactures from abroad. The next step is therefore to identify where the contraction has been concentrated and where imports have continued to grow.

Uneven outcomes across products and sectors

Figure 6 shows substantial differences across the 20 largest manufacturing chapters. Between January to August 2022 and the same months of 2026, import volume fell by about 54% for vehicles, 28% for plastics, 14% for machinery and 11% for electrical equipment. Other major chapters moved in the opposite direction. Import volume for nickel and articles thereof rose by about 91%, while inorganic chemicals increased by about 52%. For firms and trading partners, the composition of what they sell to China is consequently central to their commercial exposure.

Figure 7 shows why the sharp rise in nominal import value in 2026 does not overturn this conclusion. Between January to August 2022 and the same months of 2026, the value of manufactured imports rose by 16.9% even though the volume index fell by 12.3%. The increase in value was more than accounted for by computing products, whose imports rose from US\$317 billion to US\$557 billion. Memory chips alone added US\$147 billion to a net increase of US\$183 billion in manufactured import value. By contrast, the value of all other manufactured imports fell from US\$753 billion to US\$695 billion, or by 7.7%. The 2026 rise in headline values therefore reflects a highly concentrated development rather than a broad-based recovery in manufactured imports.

The value and volume divergence in computing products must be interpreted carefully. For semiconductors, servers and computer parts, weight is an imperfect measure of economic volume because a kilogram of product can change substantially in specification and value over time. Some of the rise in value relative to measured weight may therefore reflect higher-performance products rather than higher prices for unchanged goods. This limitation matters when interpreting the computing sector. It does not, however, affect the 7.7% fall in the value of manufactured imports outside computing, nor does it explain the much broader decline in import volume documented across thousands of manufactured products. The computing surge obscures the wider contraction in headline values, but it does not erase it.

Figure 8 moves from broad manufacturing chapters to the individual six-digit products that contributed most to the change in the volume index. The largest negative contributions include processors and controllers, petrol cars and computer storage units. Large positive contributions came from products including servers, ferro-nickel and memory chips. Strong

growth in a limited number of important products offset some of the losses elsewhere. This is consistent with the earlier findings. The overall contraction does not depend on a few badly performing products. Rather, it is the net result of substantial gains and losses across different parts of the manufactured import basket.

Granular product evidence also identifies areas of expanding foreign sales. A total of 888 manufactured products recorded volume increases of at least 25%. Among them, 165 products with imports worth at least US\$100 million each together accounted for US\$199 billion. The larger expanding product lines fall mainly into four groups: metals and nuclear-related products, computing equipment, aerospace, and pharmaceuticals and biologics. Enhanced foreign sourcing of these items may reveal growing Chinese dependencies on foreign suppliers in certain areas.

The gains in expanding markets are not always widely distributed among supplying countries. In 36 growing products worth about US\$34 billion, between one and three countries supplied at least 80% of China's imports. Chile and Argentina dominate lithium carbonate supplies, the United States accounts for about 99% of ethane imports, and Indonesia supplies about 97% of nickel mattes. Similar concentration appears in some rare-earth and nuclear-related products. This adds another dimension to the unevenness of the import picture. Even where Chinese demand from abroad is growing strongly, the commercial gains may accrue to a small number of foreign suppliers.

Taken together, Figures 6 to 8 show why the aggregate contraction must be seen alongside differences in its composition. Large declines in vehicles, plastics and several industrial products coexist with strong increases in selected metals, computing products, aerospace and pharmaceuticals. Countries and firms sell different combinations of these goods, so the same headline aggregate change is associated with very different commercial outcomes. The partner evidence bears this out. Among 36 sizeable suppliers of manufactures to China, with the EU27 treated as one partner, 25 recorded lower import volumes. Those 25 accounted for 83% of the group's manufactured sales to China in 2022. Figure 9 begins the country comparison by showing how widely import outcomes for manufactured goods differ among the members of the G20.

Uneven outcomes across trading partners

Figure 10 shows significant variation among East Asian suppliers. South Korea's manufactured sales to China rose by about 50% in value between January to August 2022 and the same months of 2026, while measured import volume fell by about 14%. The Philippines provides an even sharper example, with value rising by about 7% while measured volume fell by about 66%. Other regional suppliers moved in different directions. These results reinforce the warning against treating nominal trade values as a direct measure of realised market access. Even within a closely integrated Asian production system, the recorded outcomes differ markedly by supplier.

Figure 11 extends the comparison to the former Soviet economies and Albania. Russia stands out among the larger suppliers, with manufactured import volume rising by about 45% and value by about 57%. Kazakhstan also recorded an increase in measured volume, of about 7%, alongside a much larger rise in value of about 46%. These gains contrast with the aggregate contraction in China's manufactured imports and show that some suppliers have increased sales materially while the overall market has shrunk. The composition of these gains is important. Much of the expansion among the successful suppliers in this group is associated with refined metals, minerals and nuclear-related products rather than with the industrial sectors where many established exporters lost ground.

Figure 12 shows similarly divergent outcomes across South Asia, Turkey and the Middle East. India recorded one of the strongest gains among major suppliers, with manufactured import volume rising by about 37% and value by about 70%. Saudi Arabia moved in the opposite direction. Its measured volume fell by about 35% and value by about 48%. The contrast illustrates why changes in China's aggregate manufactured imports may not carry over to the experience of individual countries. Countries sell very different combinations of products to China, and demand and other drivers in those product markets have moved in different directions.

Figure 13 shows that this heterogeneity also extends across African suppliers. For several important resource-processing exporters, the value of manufactured sales to China increased while measured volume declined. The Democratic Republic of Congo and Zambia illustrate the commercial significance of such changes. In the separate analysis of large declining products, the

estimated volume losses were equivalent to about 32% of the Democratic Republic of Congo's total exports to China in January to August 2022 and about 29% of Zambia's. These figures do not imply that all of either country's exports declined by those amounts. They show instead how losses concentrated in particular products can be large relative to a country's overall China business. Absolute losses and exposure relative to national trade therefore need to be distinguished.

Figure 14 completes the regional comparison with Latin America and the Caribbean. Mexico experienced one of the largest contractions among major suppliers, with measured manufactured import volume falling by about 53%. Argentina lies at the opposite extreme. Its measured volume rose by about 280% and value by about 210%. Brazil also recorded higher measured export volumes to China. The contrast between Mexico and Argentina highlights that differentiated outcomes are the norm, even within the same region. Such findings also caution against attributing national export performance to geography or (geo)political affinity alone.

Table 1 shows that trading partner export outcomes can also change as China reallocates purchases among suppliers within the same product. Processors and controllers provide the clearest example. China's total import value for this product was almost unchanged at about US\$135 billion, yet Taiwan's sales rose from US\$57.6 billion to US\$77.9 billion and its share increased from 42.7% to 57.4%. Malaysia moved in the opposite direction. Malaysia's sales fell from US\$14.3 billion to US\$0.5 billion and its share from 10.6% to 0.4%. This is not simply a story of a shrinking Chinese market. To reiterate, such data cannot determine whether these outcomes reflect production relocation, export controls, changes in origin recording or other factors.

The evidence therefore supports a clear but qualified conclusion. China's manufactured import volume was about an eighth lower in January to August 2026 than in the same months of 2022, and the decline extended across most products and most major suppliers. Yet national outcomes vary greatly. India and Indonesia recorded sizeable gains, while Mexico and Malaysia experienced large contractions. The United States provides another instructive case. Its total exports to China fell from US\$117 billion to US\$100.5 billion, yet its

manufactured exports rose by about 16% in measured volume and 7% in value. Aggregate trade figures can therefore conceal substantial changes in composition. Headline values of Chinese imports must be accompanied by more granular assessments.

Overall, by volume China has cut its sourcing of manufactures from abroad significantly since 2022. That reduction was sustained but unevenly felt across China's trading partners. Whether the uneven impact was by design or by accident cannot be established with trade data alone.

Systemic implications

The first systemic implication does not require establishing Chinese intent. Some foreign governments may observe a substantial, persistent reduction in realised access to the Chinese market² at the same time as Chinese import penetration in their markets is increasing. That matters in a trading system built in large part on the principle of reciprocity. The danger is not simply the loss of export sales. Rather, political perceptions of whether existing trade relationships remain balanced shift and, where doubts exist, embolden those making demands for further import restrictions. Under these circumstances, claims by China that it obeys trade norms are unlikely to cut much ice. Norms are defensible because they support desired outcomes. Appealing to the former is unlikely to assuage decision-makers who fail to see the latter.

The second implication follows from growing distrust between governments. Even if intent cannot be established, foreign trading partners may not give Beijing the benefit of the doubt. Suspicions that beggar-thy-neighbour industrial policy, national security, security of supply or climate goals are driving Chinese policy may in turn encourage other governments to reduce their sourcing from China. That said, the very heterogeneity of outcomes across China's trading partners documented here is likely to limit how far any such backlash spreads.

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² Recall, however, that the total volume of non-manufactured goods imported by China has risen.

Figure 1. China's imports: Törnqvist volume index vs value index, monthly, Jan 2022 – Aug 2026 (2022 average month = 100).

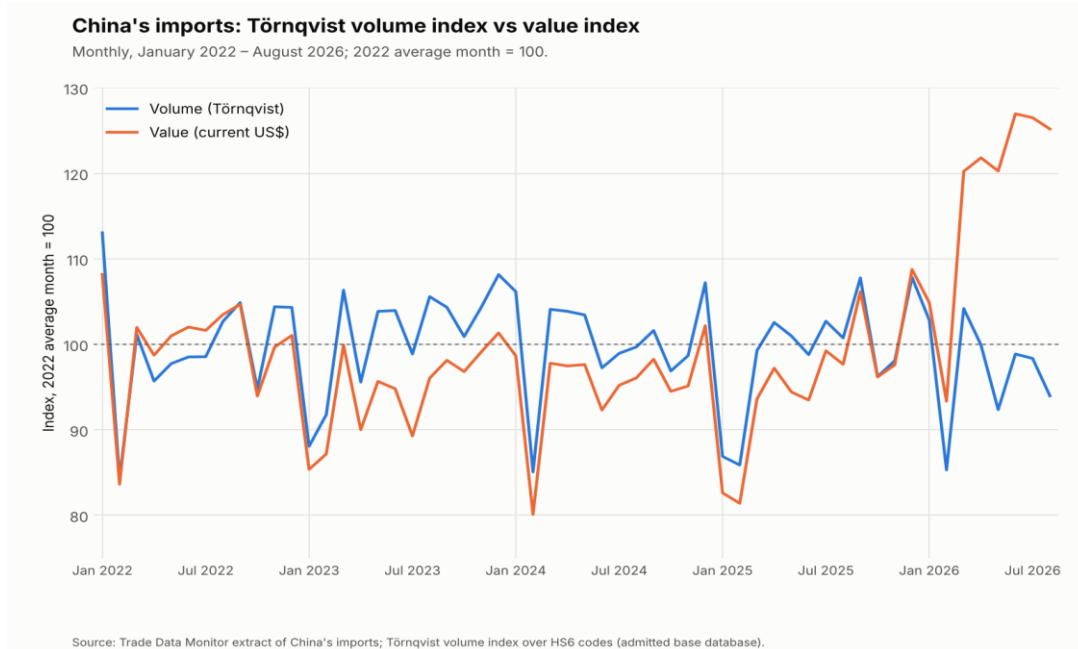


Figure 2. Import volume of manufactures (HS 28–96 excl. 71) vs non-manufactures,, monthly Törnqvist indices (2022 average month = 100).

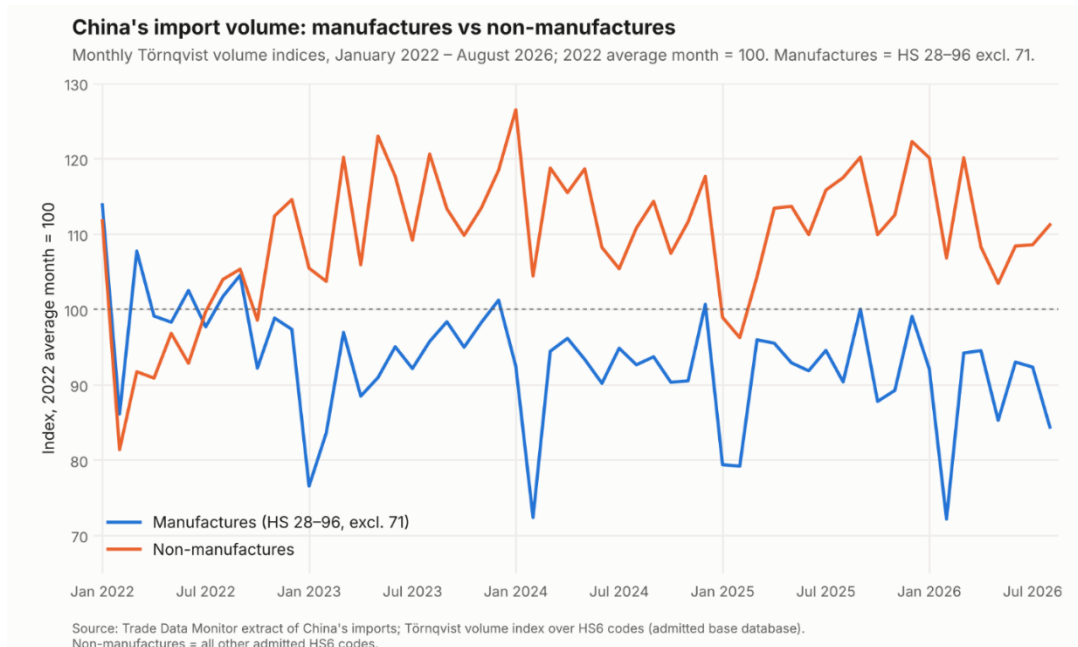


Figure 3. Manufactures volume index for all codes and excluding the top 25, 50, 100 and 250 most influential HS6 codes, quarterly averages (2022 = 100).

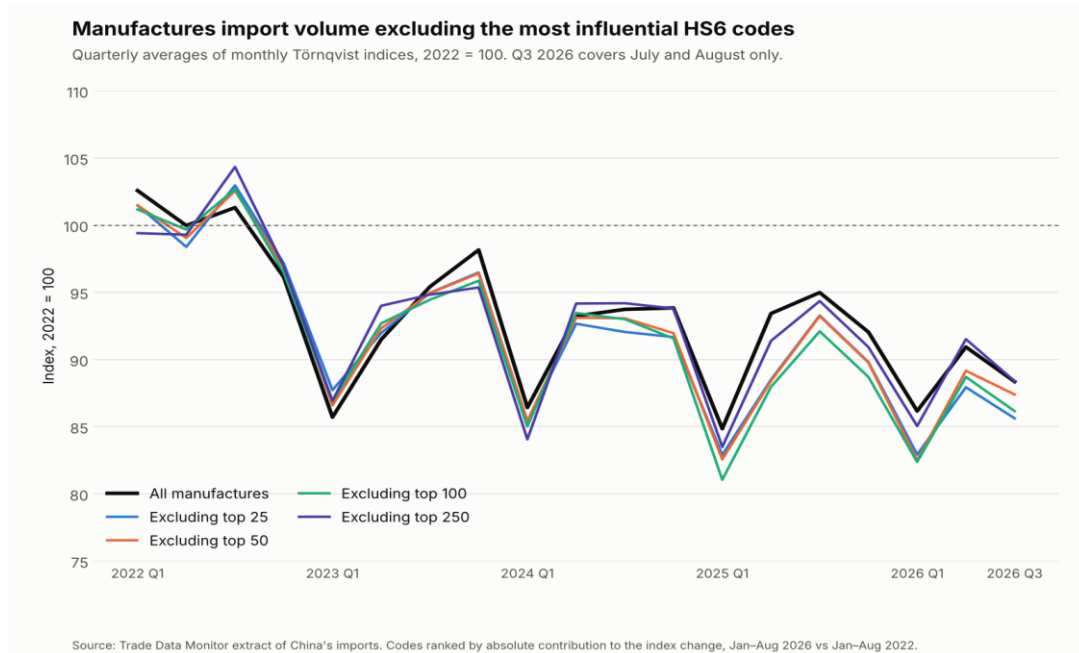


Figure 4. Cumulative share of the change in the manufactures volume index explained by the top-ranked HS6 codes, Jan-Aug 2026 vs Jan-Aug 2022.

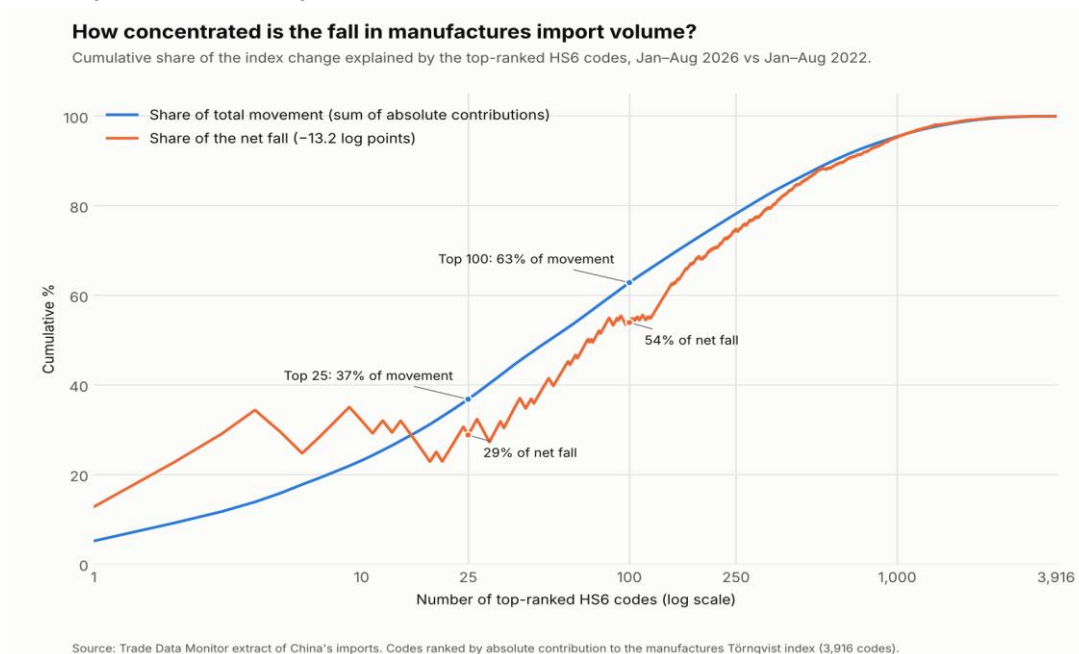


Figure 5. Cumulative distribution of the change in import weight across manufactures HS6 codes, unweighted and value-weighted, Jan–Aug 2026 vs Jan–Aug 2022.

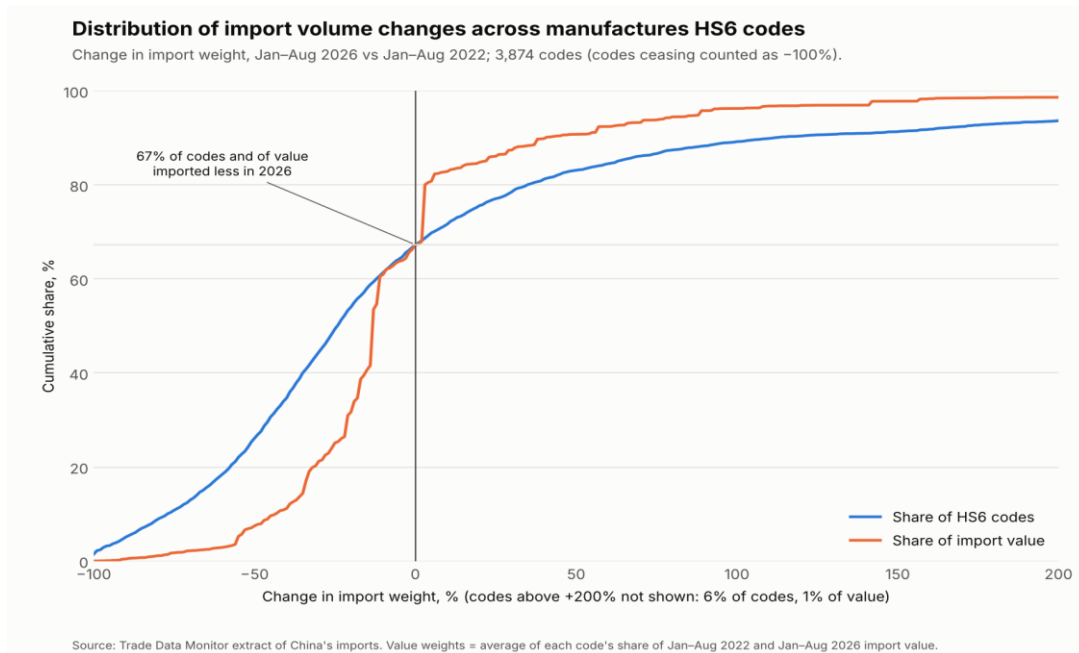


Figure 6. China's 20 largest manufacturing HS chapters (by Jan–Aug 2022 import value): change in import volume vs value.

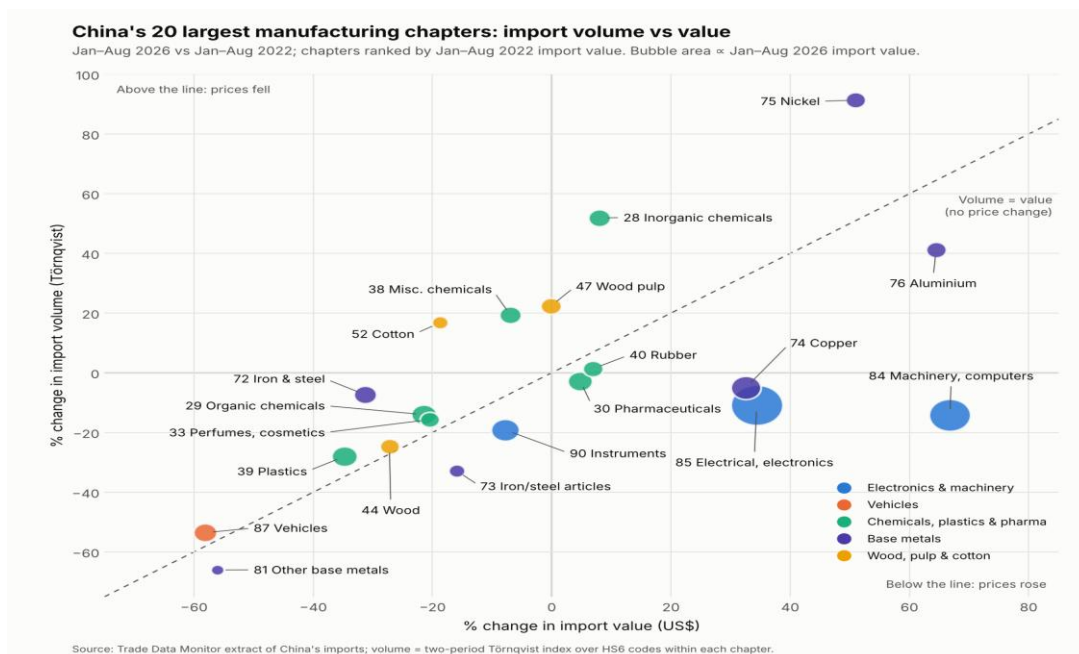


Figure 7. Value of China's manufactures imports: computing products (HS 8471, 8473 and 8542) vs all other manufactures, monthly, Jan 2022 – Aug 2026 (2022 average month = 100).

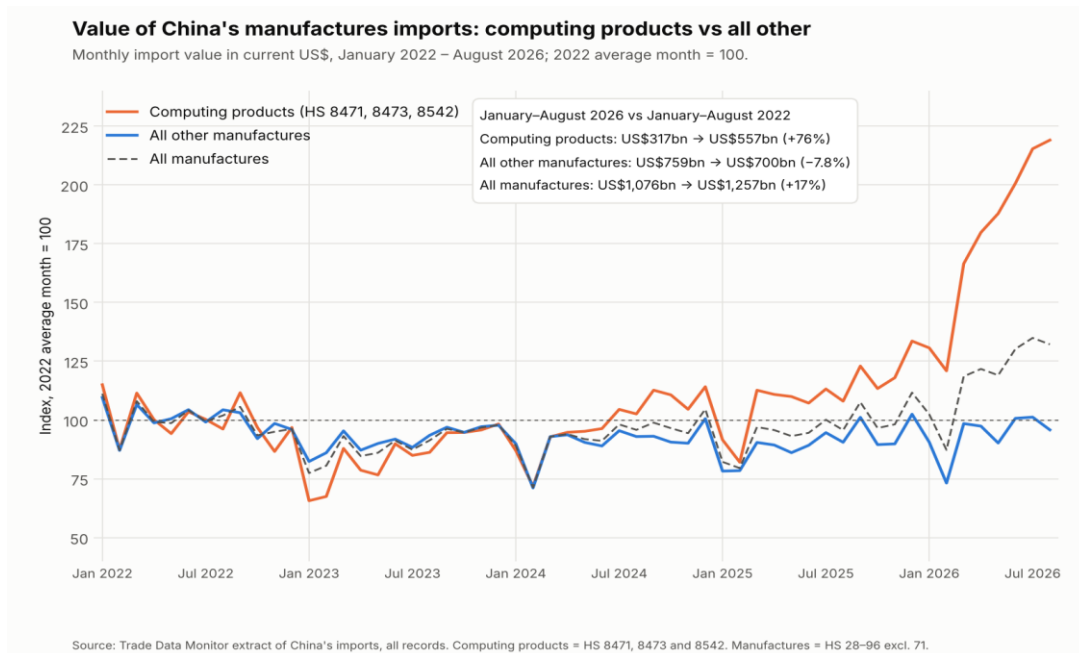


Figure 8. The 25 HS6 codes that moved the manufactures import volume index most: change in import volume vs value (log scales).

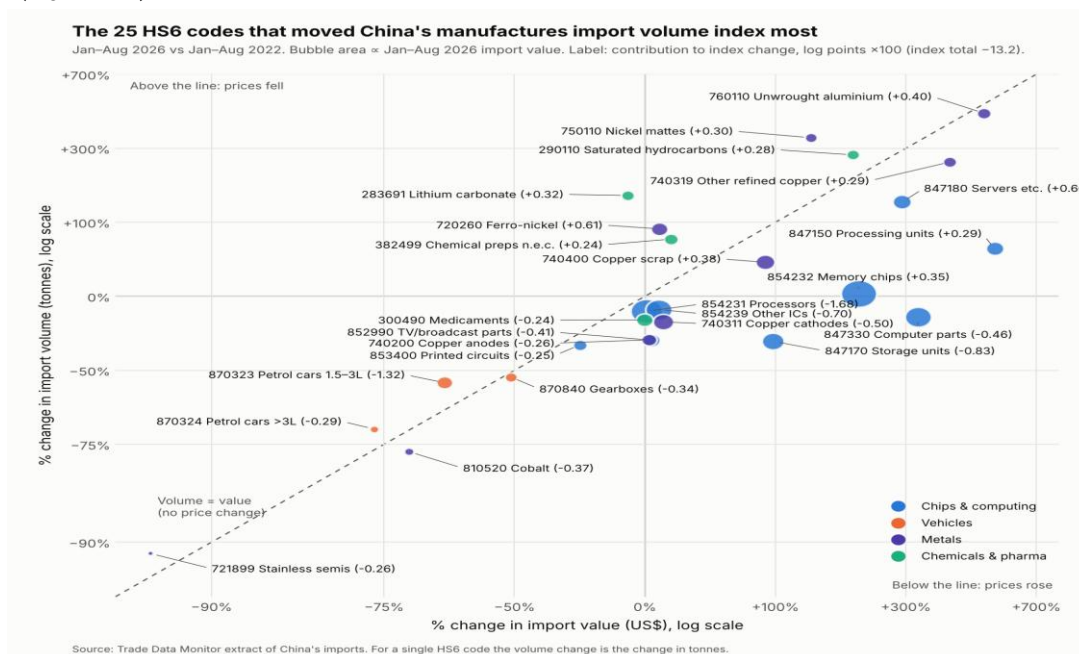


Figure 9. G20 partners (EU27 as one): change in manufactures import volume vs value, Jan–Aug 2026 vs Jan–Aug 2022.

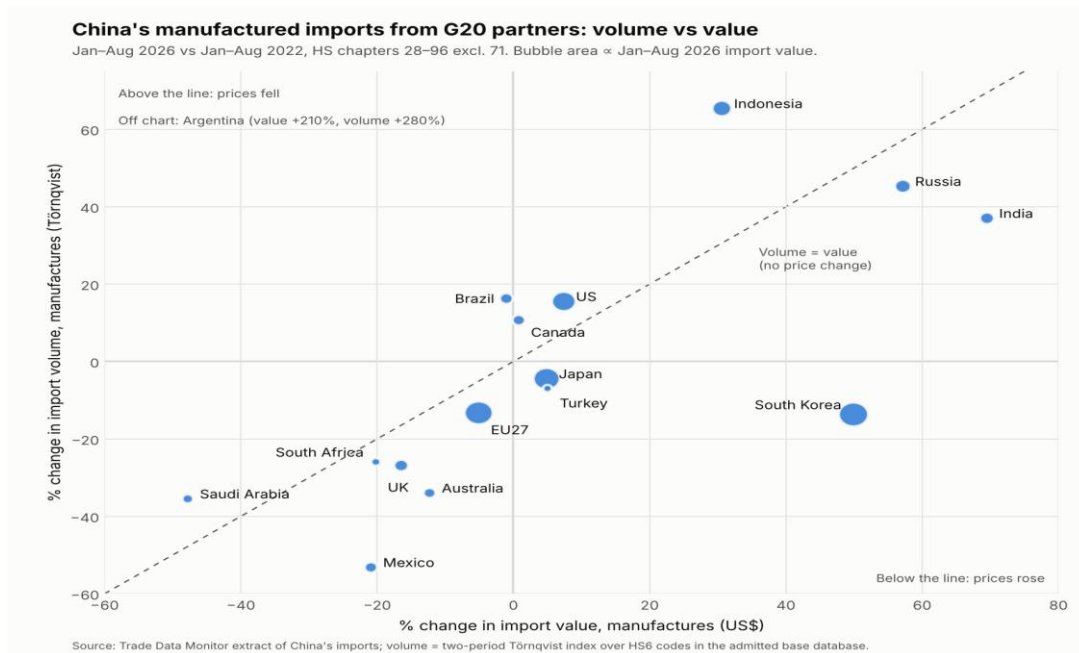


Figure 10. East Asian partners (Northeast Asia and ASEAN): change in manufactures import volume vs value.

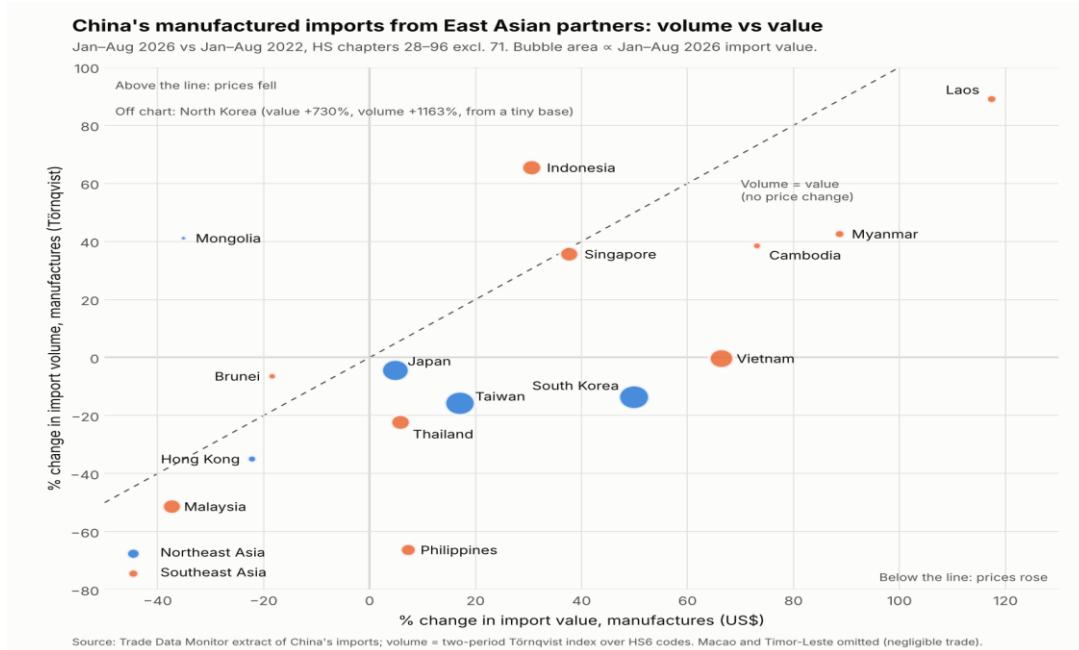


Figure 11. Former Soviet states (excluding the Baltics) and non-EU former Warsaw Pact states: change in manufactures import volume vs value.

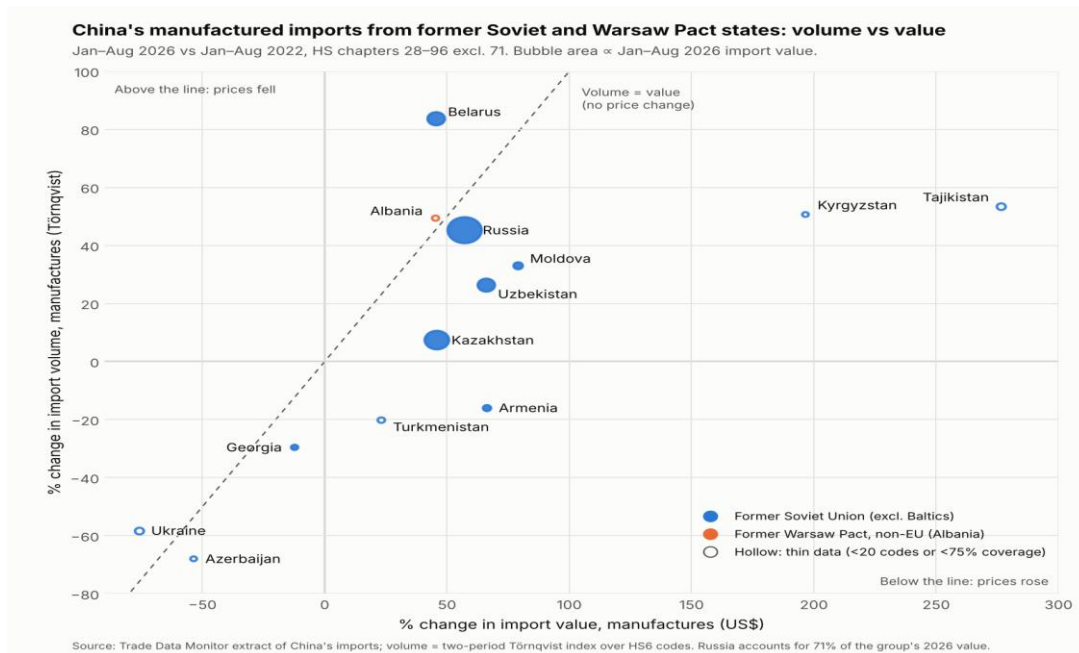


Figure 12. South Asia, Turkey and the Middle East: change in manufactures import volume vs value.

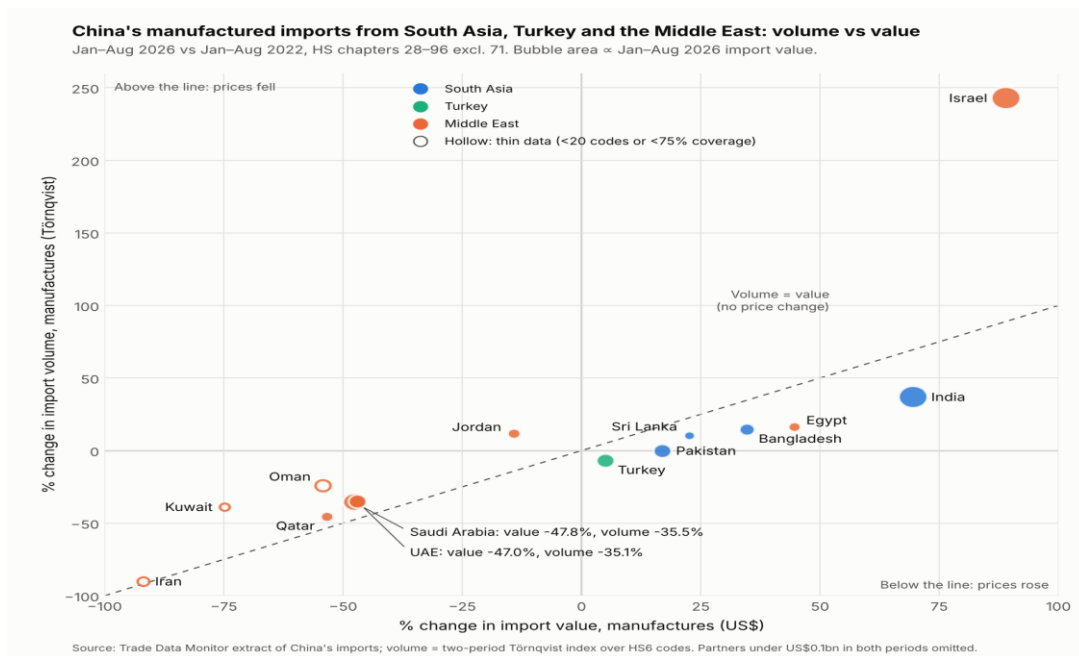


Figure 13. African partners: change in manufactures import volume vs value.

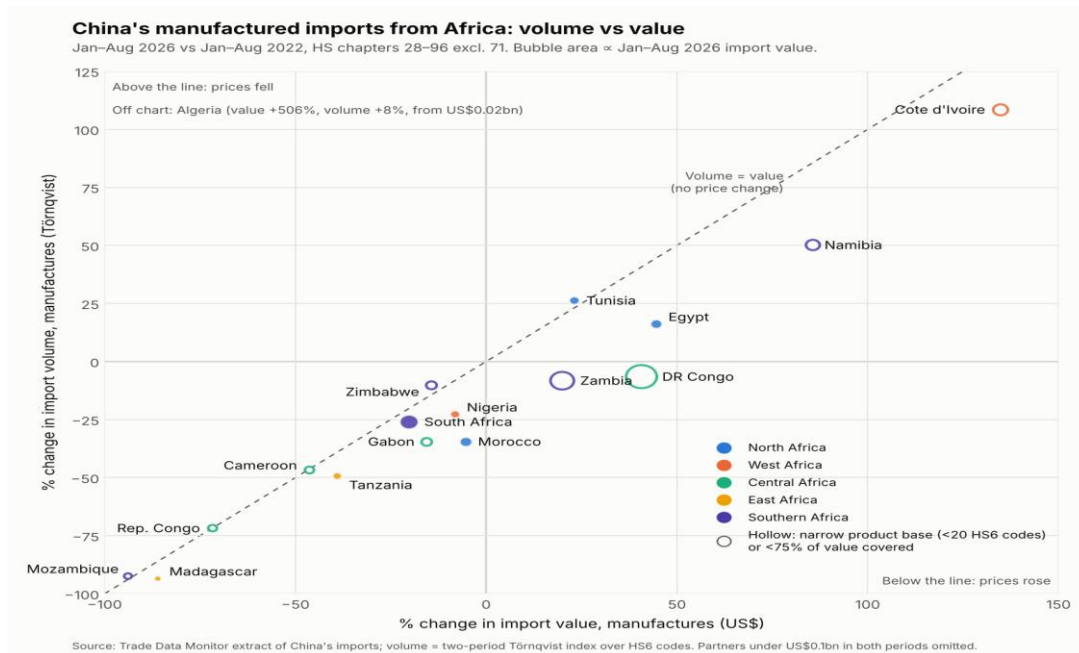


Figure 14. Latin America and the Caribbean, including Mexico: change in manufactures import volume vs value.

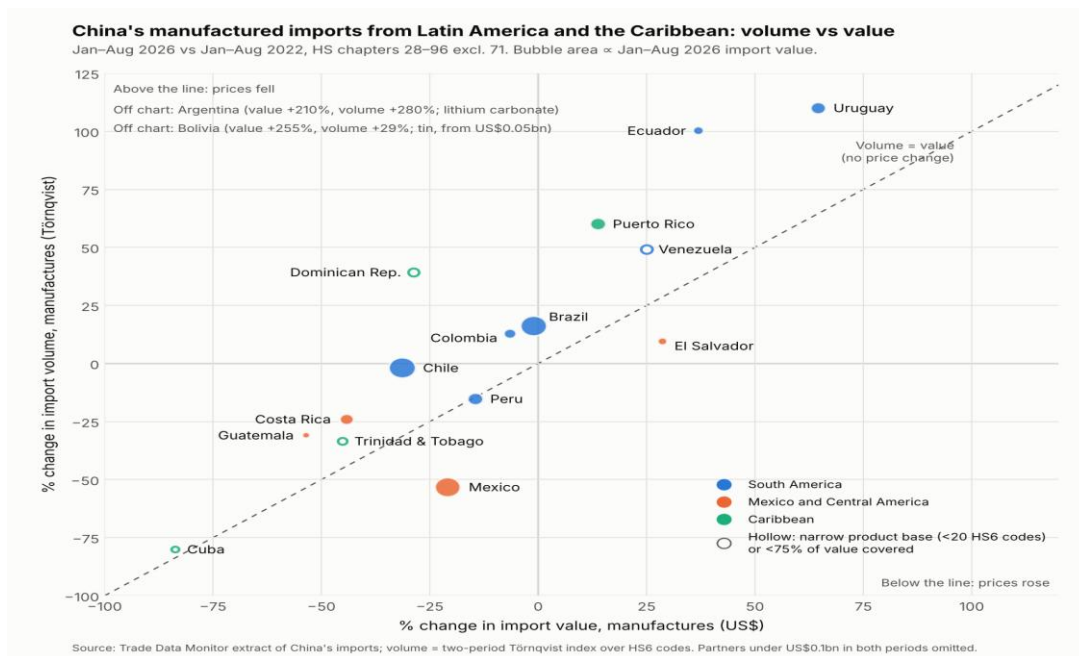


Table 1. Supplier shifts in selected products: China's imports by partner, January–August 2022 and January–August 2026

Partner	Jan–Aug 2022, US\$bn	Jan–Aug 2026, US\$bn	Change, US\$bn	Share 2022, %	Share 2026, %
Processors and controllers (HS 854231)					
All partners	134.74	135.83	+1.1	100.0	100.0
Taiwan	57.55	77.93	+20.4	42.7	57.4
South Korea	14.72	8.13	–6.6	10.9	6.0
Malaysia	14.27	0.51	–13.8	10.6	0.4
China (re-imports)	11.68	6.42	–5.3	8.7	4.7
Vietnam	10.17	0.05	–10.1	7.5	0.0
United States	6.03	17.50	+11.5	4.5	12.9
Ireland	5.12	6.47	+1.4	3.8	4.8
Israel	2.86	7.81	+5.0	2.1	5.8
Other partners	12.32	11.00	–1.3	9.1	8.1
Petrol cars, 1,500–3,000 cc (HS 870323)					
All partners	26.85	9.27	–17.6	100.0	100.0
Germany	10.86	3.06	–7.8	40.4	33.0
United States	6.13	1.43	–4.7	22.8	15.5
Slovakia	3.85	1.28	–2.6	14.3	13.8
Japan	2.65	1.64	–1.0	9.9	17.7
United Kingdom	1.52	1.20	–0.3	5.6	12.9
Other partners	1.84	0.66	–1.2	6.8	7.2
Storage units of computers (HS 847170)					
All partners	16.40	32.35	+16.0	100.0	100.0
Thailand	4.24	5.19	+0.9	25.9	16.0
Taiwan	3.28	4.67	+1.4	20.0	14.4
South Korea	3.26	2.76	–0.5	19.9	8.5
China (re-imports)	2.68	7.10	+4.4	16.3	21.9
Malaysia	1.78	3.46	+1.7	10.9	10.7
Vietnam	0.04	6.14	+6.1	0.2	19.0
Other partners	1.12	3.03	+1.9	6.8	9.4
Other electronic integrated circuits (HS 854239)					
All partners	62.42	67.06	+4.6	100.0	100.0
Taiwan	27.23	28.32	+1.1	43.6	42.2
China (re-imports)	10.03	8.99	–1.0	16.1	13.4
South Korea	6.41	3.39	–3.0	10.3	5.1
Malaysia	4.38	1.11	–3.3	7.0	1.7
Philippines	3.60	0.10	–3.5	5.8	0.1
Japan	3.27	6.14	+2.9	5.2	9.1
United States	1.30	9.65	+8.3	2.1	14.4
Other partners	6.20	9.36	+3.2	9.9	14.0
Other units of computers (HS 847180)					
All partners	4.01	15.73	+11.7	100.0	100.0
China (re-imports)	2.08	6.51	+4.4	51.9	41.4

Taiwan	1.14	5.21	+4.1	28.5	33.1
Malaysia	0.33	0.29	0.0	8.2	1.8
Thailand	0.16	1.06	+0.9	4.0	6.7
Hungary	0.06	0.04	0.0	1.5	0.3
Vietnam	0.03	2.14	+2.1	0.9	13.6
Other partners	0.21	0.48	+0.3	5.1	3.0
Memories (HS 854232)					
All partners	69.90	217.31	+147.4	100.0	100.0
South Korea	34.38	120.34	+86.0	49.2	55.4
Taiwan	17.88	22.29	+4.4	25.6	10.3
China (re-imports)	10.70	40.84	+30.1	15.3	18.8
Japan	4.08	26.89	+22.8	5.8	12.4
Singapore	1.51	5.31	+3.8	2.2	2.4
Other partners	1.36	1.63	+0.3	1.9	0.8

Note: The five HS6 codes with the largest absolute contributions to the change in the manufactures volume index (ranks 1–5), plus memories (HS 854232), the manufactures code with the largest increase in import value. Partners shown are the five largest suppliers of each code in either period; all other partners are combined. Values in current US\$, all records. "China (re-imports)" is the partner recorded as China in the extract. Source: Trade Data Monitor extract of China's imports.

Box 1. Data annex: sources, construction of import volumes and index methods

1. Source, coverage and periodicity

All evidence presented here was based on a single data extract of China's official monthly import statistics, as distributed by Trade Data Monitor (TDM). The extract was drawn on 4 October 2026 and covers January 2022 to August 2026, that is, 56 months.

Each record gives, for one product, one partner and one month, the import value in US dollars and up to two quantities, each with its unit of measurement. The fields used are PARTNER, COMMODITY (the product code), YEAR, MONTH, VALUE, QTY1, UNIT1, QTY2 and UNIT2. Products are identified at the six-digit level of the Harmonized System (HS6). Partners are recorded as reported in China's statistics, which attribute imports to the country of origin.

The extract contains 3,800,106 records, 5,248 HS6 codes and 254 partners, with total imports of US\$12,555 billion. Of the 5,248 codes, 5,245 match the HS 2022 nomenclature. The other three (980100, 980400 and 980500) are Chinese national codes in Chapter 98, which lies outside the HS.

Where a figure compares two periods, the comparison is between January–August 2022 and January–August 2026. The same eight months are used in both years because the data end in August 2026 and because Chinese imports are strongly seasonal, with a regular fall around the Lunar New Year in January and February.

To replicate the work, draw a TDM extract with the same characteristics: reporter China; imports; all HS6 codes; all partners shown separately; monthly; January 2022 to August 2026; values in US dollars; both quantity fields with their units. Should TDM (or Chinese customs authorities) revise their data, a later extract may differ slightly.

2. Why a common quantity measure is needed

An import volume index needs, for each product, a quantity that is measured in the same unit in every period. China does not report the same quantity unit for all products. The extract contains 16 unit codes: KG (kilograms), GM (grams) and CAR (carats), which measure weight; NO (number of items), PRS (pairs), HUN (hundreds of items) and THS (thousands of items), which are counts; L (litres), M3 (cubic metres), BBL (barrels) and TL (not documented in the extract, used only for HS 220190, where it equals about one-thousandth of the kilogram figure and is probably thousands of litres), which measure volume; M (metres); M2 (square metres); KWH (kilowatt-hours); MBQ (megabecquerels); and X, which denotes that no unit is reported.

Three features of the data determine the choice of measure.

1. A weight unit (KG, GM or CAR) appears in 3,799,625 of the 3,800,106 records. The remaining 481 records are 190 records for electricity (HS 271600), which report kilowatt-hours only, and 291 records with unit X in both positions, of which 285 are pipeline natural gas (HS 271121).
2. The second quantity differs between products. Almost two-thirds of codes (3,332, or 63.5%) report weight alone. Apart from electricity and pipeline gas, the rest add a count, a length, a volume, an area or a measure of radioactivity. These different quantity measures cannot be added together or compared.
3. For some products the second quantity is not always the same over time. Crude petroleum (HS 270900), for example, was reported in kilograms in 2022 and 2023 and in barrels and kilograms from January 2024. In some other product codes, part of the trade is reported with a count and part without one. In all, 67 six-digit HS codes report more than one pair of units.

Weight, converted to metric tonnes, was used as the quantity measure for every product. The one exception is electricity, which is measured in kilowatt-hours. All non-weight quantities are set aside. A Törnqvist index compares each product only with itself, so the use of kilowatt-hours for one product does not affect the others.

3. Construction of the base database of volume series

Monthly volume series were built at two levels: for each HS6 code, with all partners combined, and for each HS6 code and partner. The procedure has ten steps. The parameters are summarised in the table at the end of this section.

1. **Reading and validation.** The file is read with product codes and months kept as text, so that leading zeros are preserved, and product codes are left-padded with zeros to six characters as a safeguard. Checks confirmed that every record is an import by China valued in US dollars, that no field is empty, that every product code consists of six digits and that no value or quantity is negative. A total of 918 records have a value of zero and are retained.
2. **Choice of quantity.** For each record, the weight is taken from QTY1 if UNIT1 is a weight unit (KG, GM or CAR); otherwise from QTY2 if UNIT2 is a weight unit; otherwise the record has no weight. Where both units are weights, QTY1 and QTY2 are identical in every record. A quantity reported with unit X is never assumed to be a weight. For electricity (HS 271600), QTY1 in kilowatt-hours is used instead of a weight and is processed by the same rules as the weights.
3. **Conversion to tonnes.** Kilograms are multiplied by 0.001, grams by 0.000001 and carats by 0.0000002 (one carat is 0.2 grams).
4. **Identification of missing weights.** A record has a missing weight if its tonnage is not greater than zero. There are 239,436 such records (6.3% of records, US\$95.4 billion or 0.76% of value). Of these, 239,145 report a weight of zero and 291 report no unit. Almost all the value of the latter is pipeline gas. Every positive weight in the extract is a whole number of kilograms, grams or carats, so very small consignments tend to be recorded as zero. The median value of a record with a missing weight is US\$124.
5. **Reference prices.** For each record with a positive weight and a positive value (3,560,480 records, called screenable records), the price per tonne is computed as value divided by tonnes and expressed as its base-10 logarithm, denoted by p . Two reference prices are calculated as value-weighted medians of p . The pair reference covers all screenable records for an HS6 code and partner over the full 56 months, and is defined only if the pair has at least six screenable records (99,074 of 181,337 pairs qualify). The HS6-year reference covers all screenable records for an HS6 code in one calendar year across all partners, with no minimum (25,204 code-years). To find a value-weighted median, sort the records in a group by p , cumulate their values in that order, and take the p of the first record at which the running total reaches half of the group total. Weighting by value prevents the reference from being set by numerous small, high-priced consignments. A third reference, used only in step 7, is the unweighted median of p over all screenable records of an HS6 code in all years.
6. **Screening of implausible weights.** A screenable record is flagged as an outlier if all three of the following hold: (a) its p differs from the HS6-year reference by 2 or more, that is, by a factor of 100 or more (recall a logarithm was taken to obtain p); (b) its p also differs from its pair reference by 2 or more, or the pair has no reference; and (c) it is not a light record. A light record is one whose p is above the HS6-year reference (its weight looks too low for its value) and whose weight is below one tonne. Light records are exempt because very small consignments of high-value goods can carry a high price per tonne with no error in the weight. Of 13,193 records meeting conditions (a) and (b), 8,214 are exempt and 4,979 are flagged (US\$0.25 billion). Of the 13,193, 2,650 differ from the HS6-year reference by a factor between

500 and 2,000, which is consistent with confusion between kilograms and tonnes or between grams and kilograms.

7. **Imputation.** The reported weight of each flagged record is discarded. Each record with a missing or flagged weight is given an imputed weight equal to its value divided by 10 to the power of its reference p . The pair reference is used where available, otherwise the HS6-year reference, otherwise the unweighted median for the HS6 code. Records with a value of zero receive an imputed weight of zero. In total 244,415 records are imputed, worth US\$95.6 billion (0.76% of value), of which US\$93.8 billion is pipeline gas. The references used are: pair, 163,315 records; HS6-year, 80,237; unweighted HS6 median, 260. 603 records in 30 codes, including pipeline gas and 980100, have no reference because their code has no screenable record; they receive no imputed weight.
8. **Aggregation.** Reported and imputed tonnes are summed into monthly series for each HS6 code and for each HS6 code and partner, together with the monthly import value, the value of imputed records and the number of records. Records for the same code, partner and month (75,193 records in 60 codes, which occur when national tariff lines within an HS6 code involve different unit pairs) are added together. A month without imports is left absent rather than set to zero.
9. **Jump test.** For each month of a series that contains imputed tonnage, let V be the month's volume including imputed tonnage and I the imputed tonnage. The reference R is the median of V over up to 12 earlier months in which the series has imports (counted as observations, not calendar months); if there is no earlier month, the median over up to 12 later months is used; if the series has only one month, the month passes. The month fails if $V > 3R$ and $V - I \leq 3R$, that is, if imputation pushes the month above three times its norm. A series with any failing month fails the test. 126 HS6 series and 10,951 HS6-partner series fail.
10. **Admission.** A series is admitted to the base database if (a) it contains no record without a reference, (b) the value of imputed records is no more than 1% of the series' total value over the 56 months (a series with zero total value counts as 0%), and (c) it passes the jump test. The 1% limit is applied to value, not to the number of records, because missing weights are concentrated in very small consignments; for HS6-partner series, which usually have at most 56 records, a limit on records would also exclude any series with a single imputed record.

The result is a base database of 4,927 of 5,248 HS6 series (93.9% of series, 98.9% of import value) and 144,341 of 181,337 HS6-partner series (79.6% of series, 99.1% of import value). Of the 321 excluded HS6 codes, 30 have no usable quantity, 165 exceed the 1% limit only, 36 fail the jump test only and 90 fail both. The excluded codes account for US\$132.9 billion (1.1% of import value), of which US\$93.8 billion is pipeline gas. The admitted HS6 series include electricity and the two Chapter 98 codes 980400 and 980500. As a sensitivity check, without the outlier screen in step 6, 4,964 HS6 series and 145,728 HS6-partner series would be admitted; with the factor-of-100 screen but without the light-record exemption, 4,840 and 141,852 would be admitted.

Parameter	Value	Step
Common quantity measure	Weight in metric tonnes; kilowatt-hours for HS 271600	2–3
Conversion factors to tonnes	KG 0.001; GM 0.000001; CAR 0.0000002	3
Missing weight	Tonnage not greater than zero	4
Screenable record	Weight above zero and value above zero	5
Price measure	log10 of US\$ per tonne	5

Pair reference	Value-weighted median over 56 months; at least 6 screenable records	5
HS6-year reference	Value-weighted median across partners in a calendar year	5
Fallback reference	Unweighted median for the HS6 code, all years	5, 7
Outlier threshold	Factor of 100 (2 in log10) from both references	6
Light-record exemption	p above HS6-year reference and weight under 1 tonne	6
Imputed weight	Value ÷ 10 ^{^(reference p)}	7
Jump test	Fails if $V > 3R$ and $V - I \leq 3R$; R from up to 12 earlier (else later) observations	9
Admission	No record without reference; imputed value ≤ 1%; no jump	10

4. Törnqvist import volume indices

Monthly indices (Figures 1, 2 and 3). Each month t is compared directly with the average month of 2022. For each admitted HS6 code i , the base quantity $\bar{q}_i$ is the total volume in the twelve months of 2022 divided by 12 (months without imports count as zero), and the base value is the total 2022 import value. Codes with zero base quantity or zero base value are dropped. A code enters the comparison for month t if, in addition, it has positive volume and positive value in month t ; a code absent in month t is left out of that month's calculation. Value shares are calculated within this matched set of codes. The index is:

$$\ln Q_t = \sum_i \frac{1}{2} (s_{i,0} + s_{i,t}) \times \ln(q_{i,t} / \bar{q}_i)$$

where $q_{i,t}$ is the volume of code i in month t , $s_{i,0}$ is its share of the 2022 import value of the matched set and $s_{i,t}$ its share of the month- t import value of the matched set. Q_t is then divided by the arithmetic average of its twelve 2022 values and multiplied by 100, so that the average month of 2022 equals 100. The matched codes cover 98.6–99.2% of each month's total import value for all imports (4,330 to 4,491 codes) and 99.1–99.8% for manufactures (3,608 to 3,726 codes). The indices are not seasonally adjusted. The all-imports index uses all 4,927 admitted HS6 series, including electricity and the two admitted Chapter 98 codes; excluding the Chapter 98 codes changes no monthly value by more than 0.3 index points.

Value index (Figure 1). The value index is total monthly import value in US dollars, for all records whether or not admitted, divided by the 2022 monthly average and multiplied by 100.

Definition of manufactures (Figures 2 to 14). Manufactures are HS chapters 28 to 96, excluding chapter 71 (precious metals and stones). Chapters 97 (works of art), 98 and 99 are therefore excluded. The definition includes base metals in unwrought form (chapters 72 to 81), raw textile fibres (chapters 50 to 53) and wood (chapter 44). The manufactures index in Figure 2 applies the monthly index above to the admitted HS6 series in these chapters.

Computing products and other manufactures (Figure 7). Manufactures are divided into computing products, defined as HS headings 8471 (automatic data-processing machines and their units), 8473 (parts and accessories of the machines of headings 8470 to 8472, including parts of computers) and 8542 (electronic

integrated circuits, including processors and memories), and all other manufactures. For each group, total monthly import value in current US dollars, over all records whether or not admitted, is divided by the group's 2022 monthly average and multiplied by 100. The panel on the chart gives the sums over January–August 2022 and January–August 2026 in current US dollars. Figure 7 measures value only and contains no volume information.

Contributions of individual codes (Figures 3, 4 and 8, and Table 1). In the monthly manufactures index, the term $\frac{1}{2}(s_{i,0} + s_{i,t}) \times \ln(q_{i,t} / \bar{q}_i)$ is the contribution of code i to the log index in month t . The contribution of code i to the change between January–August 2022 and January–August 2026 is the sum of its monthly terms over January–August 2026 divided by eight, minus the sum of its monthly terms over January–August 2022 divided by eight. A code absent from a month contributes zero in that month. The contributions of all codes sum to the change in the average log index between the two periods, -0.1316 , shown in the figures as -13.2 log points (multiplied by 100). Of the 3,916 admitted manufactures codes, 3,885 have a contribution; the other 31 are not in the matched set in any of the sixteen months. Codes are ranked by the absolute value of their contribution.

Figure 3 removes the top 25, 50, 100 or 250 codes in this ranking, recomputes the monthly index from the remaining codes (with base values and shares recalculated), rebases each version so that the 2022 average equals 100, and plots the quarterly average of the monthly values; the third quarter of 2026 covers July and August only. Figure 4 plots, against the number of top-ranked codes, the cumulative sum of absolute contributions as a share of the total of 32.7 log points, and the cumulative net contribution as a share of -13.2 log points.

Distribution of changes (Figure 5). For each admitted manufactures HS6 code with positive tonnage in January–August 2022 (3,874 codes), the percentage change in total tonnes (reported plus imputed) between January–August 2022 and January–August 2026 is calculated. The 57 codes with no imports in January–August 2026 are recorded as -100% . The 42 codes with imports only in 2026 have no defined change and are excluded. The value-weighted distribution weights each code by the average of its shares of the import value of all admitted manufactures series in January–August 2022 and in January–August 2026, renormalised to sum to one over the 3,874 codes. Both cumulative distributions are evaluated in steps of one percentage point from -100% to $+200\%$; 6% of codes, carrying 1% of value, lie above $+200\%$ and are not shown.

Two-period indices for products, chapters and partners (Figures 6 and 8 to 14). For comparisons between January–August 2022 and January–August 2026, volumes and values are summed over the eight months of each period and a two-period Törnqvist index is computed:

$$\ln Q = \sum_i \frac{1}{2} (s_{i,2022} + s_{i,2026}) \times \ln(q_{i,2026} / q_{i,2022})$$

The sum applies to all HS6 codes with positive volume and value in both periods, and the shares are calculated within that matched set. Codes that enter or leave between the periods are therefore omitted from the volume measure. The volume change is $Q - 1$.

- Figure 8 shows the 25 codes with the largest absolute contributions. For a single code the two-period index reduces to the change in tonnes; the value change is computed from the same admitted series. The label gives each code's contribution. Both axes are logarithmic because the changes range from -91% to more than $+500\%$.
- Figure 6 shows the 20 manufacturing chapters with the highest January–August 2022 import value, measured over all records in the chapter. The volume change is the two-period index over the chapter's admitted HS6 series; the value change and the bubble size use all records in the chapter.

- Figures 9 to 14 provide evidence on China's trading partners. The volume change is the two-period index over each partner's admitted HS6-partner series in manufactures; for the EU27, the series of the 27 member states are first added together by HS6 code. The value change and bubble size use all manufactures records for the partner, whether or not admitted.

In Figures 6 and 8 to 14 the horizontal axis shows the change in value and the vertical axis the change in volume. The diagonal marks equal changes: a point above it implies a fall in the average price (unit value) and a point below it implies a rise. The implied price change equals $(1 + \text{value change}) / (1 + \text{volume change}) - 1$. Bubble areas are proportional to January–August 2026 import value, with a minimum size for very small partners. In Figures 11 to 14, a hollow bubble marks a partner whose volume estimate rests on fewer than 20 matched HS6 codes or on matched codes covering less than 75% of its January–August 2022 manufactures import value.

Supplier shares in selected products (Table 1). Table 1 covers the five HS6 codes with the largest absolute contributions to the change in the manufactures volume index (ranks 1 to 5 in the ranking used for Figures 3, 4 and 8) and memories (HS 854232), the manufactures code with the largest increase in import value between the two periods. For each code it reports import value by partner, summed over January–August 2022 and over January–August 2026, over all records whether or not admitted, in current US dollars. Partners shown are those among the code's five largest suppliers in either period; all other partners are combined. Shares are of China's total imports of the code in each period. Values rather than volumes are used because the table describes each partner's share of China's purchases of a single product.

Partner groupings. The partner names below are those used in the TDM extract.

- G20 (Figure 9): Argentina, Australia, Brazil, Canada, EU27, India, Indonesia, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, United Kingdom and United States. China is the importer. The African Union is not included. EU27 is taken to be Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.
- East Asia (Figure 10). Northeast Asia: Japan, South Korea, North Korea, Taiwan, Hong Kong, Macao and Mongolia. Southeast Asia: Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam and Timor-Leste.
- Former Soviet and Warsaw Pact states (Figure 11): Russia, Ukraine, Belarus, Moldova, Georgia, Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan (the former Soviet republics other than the Baltic states), and Albania (the only former Warsaw Pact member, other than the Soviet Union itself, that is not now in the EU).
- South Asia, Turkey and the Middle East (Figure 12). South Asia: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. Turkey. Middle East: Bahrain, Egypt, Gaza Strip and West Bank, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, United Arab Emirates and Yemen.
- Africa (Figure 13). North: Algeria, Egypt, Libya, Mauritania, Morocco, Sudan, Tunisia and Western Sahara. West: Benin, Burkina Faso, Cabo Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo. Central: Angola, Cameroon, Central African Republic, Chad, Congo (DROC), Congo (ROC), Equatorial Guinea, Gabon, and Sao Tome and Principe. East: Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, South Sudan, Tanzania and Uganda. Southern: Botswana, Eswatini, Lesotho, Malawi, Mozambique, Namibia, South Africa, Zambia and Zimbabwe. Egypt appears in both Figure 12 and Figure 13.
- Latin America and the Caribbean (Figure 14). South America: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay and Venezuela. Mexico and Central America:

Mexico, Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama. Caribbean: Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Bermuda, Bonaire, Sint Eustatius and Saba, British Virgin Islands, Cayman Islands, Cuba, Curacao, Dominica, Dominican Republic, French Antilles, Grenada, Guadeloupe, Haiti, Jamaica, Martinique, Montserrat, Puerto Rico, Saint Barthelemy, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Sint Maarten, Trinidad and Tobago, Turks and Caicos Islands, and Virgin Islands, United States.

All G20 and former Soviet and Warsaw Pact partners are plotted. In East Asia, Macao and Timor-Leste are not plotted because their trade is negligible. In Figures 12 to 14, partners with less than US\$0.1 billion of manufactured imports in both periods are not plotted. Partners lying beyond the axes are reported in a note on the chart. Re-imports from "China" and the "Unidentified" partner are included in the HS6-level figures (Figures 1 to 8) but not in any partner chart. In Table 1 they are shown separately as "China (re-imports)".

5. Limitations

- Weight is an imperfect measure of volume where an HS6 code covers goods of very different value per tonne. A shift in product mix then appears as a change in volume. This probably matters most for semiconductors, servers and computer parts, where the value per kilogram has risen sharply; for these products, weight is likely to understate growth in real volume.
- The indices are matched-model indices: products that appear for the first time, or disappear, between the periods compared do not affect the volume measures.
- The outlier screen compares each record with the norm for its own pair and code. It cannot detect cases where most of a code's weights are wrong. Copper powder (740610), large AC generators (850162) and wind-powered generating sets (850231) exhibit this pattern and are excluded from the base database at step 10; other such codes may have been admitted.
- The thresholds (the 1% value limit, the factor of 100, the one-tonne exemption, the factor of three and the twelve-observation window in the jump test, and the six-record minimum for a pair reference) are choices. The sensitivity results in section 3 show how the size of the base database depends on them.
- Pipeline natural gas (HS 271121, US\$93.8 billion over the period) reports no quantity and is absent from all volume indices.
- Partner attribution follows China's recording of country of origin. Changes in where goods are processed, or in how origin is recorded, appear as changes in partner volumes.

The base database and all indices were computed in Python. A reference script reproduces the base database exactly (4,927 HS6 series and 144,341 HS6-partner series) from the TDM extract.