

Statistical Insights: Merchandise trade statistics without asymmetries

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To properly understand global trade patterns we need high quality, consistent and harmonised statistics on international merchandise trade. Currently available statistics, however, fall short of this standard. In theory the exports of country A to country B should mirror the imports of country B from country A, but in practice this is rarely the case. To tackle this issue the OECD, through its Working Party on International Trade in Goods and Services Statistics, bringing

together over 40 countries, has developed a transparent and replicable approach for reconciling international merchandise trade statistics. The first version of the resulting dataset is now available.

How large are trade asymmetries?

Table 1 shows some of the largest asymmetries in reported global trade, by main product category. And they are very large. For example, the US reports USD 35 billion more imports of electrical machinery from China than China reports as exports to the US; accounting for around one-third of the actual value traded. The twelve top discrepancies alone (out of nearly 100 products and over 200 countries), account for USD 182 billion, or 1% of global merchandise trade.

Table 1. Examples of large trade asymmetries (reported imports and mirror exports), by product 2014, million USD

Reporter country	Partner country	Product (HS chapter number)	Reported imports	Mirror exports	Imports -/ - Exports	
Netherlands	Russia	Mineral fuels and oils (27)	21 650	57 294	-35 644	
USA	China	Electrical machinery, equipment and parts (85)	127 093	92 550	34 543	
China	Korea	Electrical machinery, equipment and parts (85)	76 674	51 182	25 492	
China	Japan	Electrical machinery, equipment and parts (85)	40 572	25 751	14 820	
USA	China	Nuclear reactors, machinery & mechanical app. (84)	105 279	90 883	14 396	
Germany	China	Electrical machinery, equipment and parts (85)	28 804	14 458	14 346	
Germany	Norway	Mineral fuels and oils (27)	8 137	20 105	-11 968	
France	China	Electrical machinery, equipment and parts (85)	14 397	5 551	8 846	
France	Russia	Mineral fuels and oils (27)	11 641	4 132	7 509	
Netherlands	China	Nuclear reactors, machinery & mechanical app. (84)	15 695	22 019	-6 323	
Spain	France	Vehicles and parts (87)	10 664	5 105	5 559	
Spain	Russia	Mineral fuels and oils (27)	6 971	3 421	3 550	

Source: UN Comtrade

□ Why do trade asymmetries exist?

Asymmetries in international merchandise trade statistics exist for a variety of reasons. First of all, exports and imports are valued differently: exports are valued ‘free on board’ (FOB), but imports include the ‘costs of insurance and freight’ (CIF). This margin however averages just 5% of international trade flows (Miao and Fortanier, 2017) and so explains only a small part of the discrepancies. Differences in customs regimes and methodologies also have an effect, as do differences in confidentiality policies, product classifications, and time of recording.

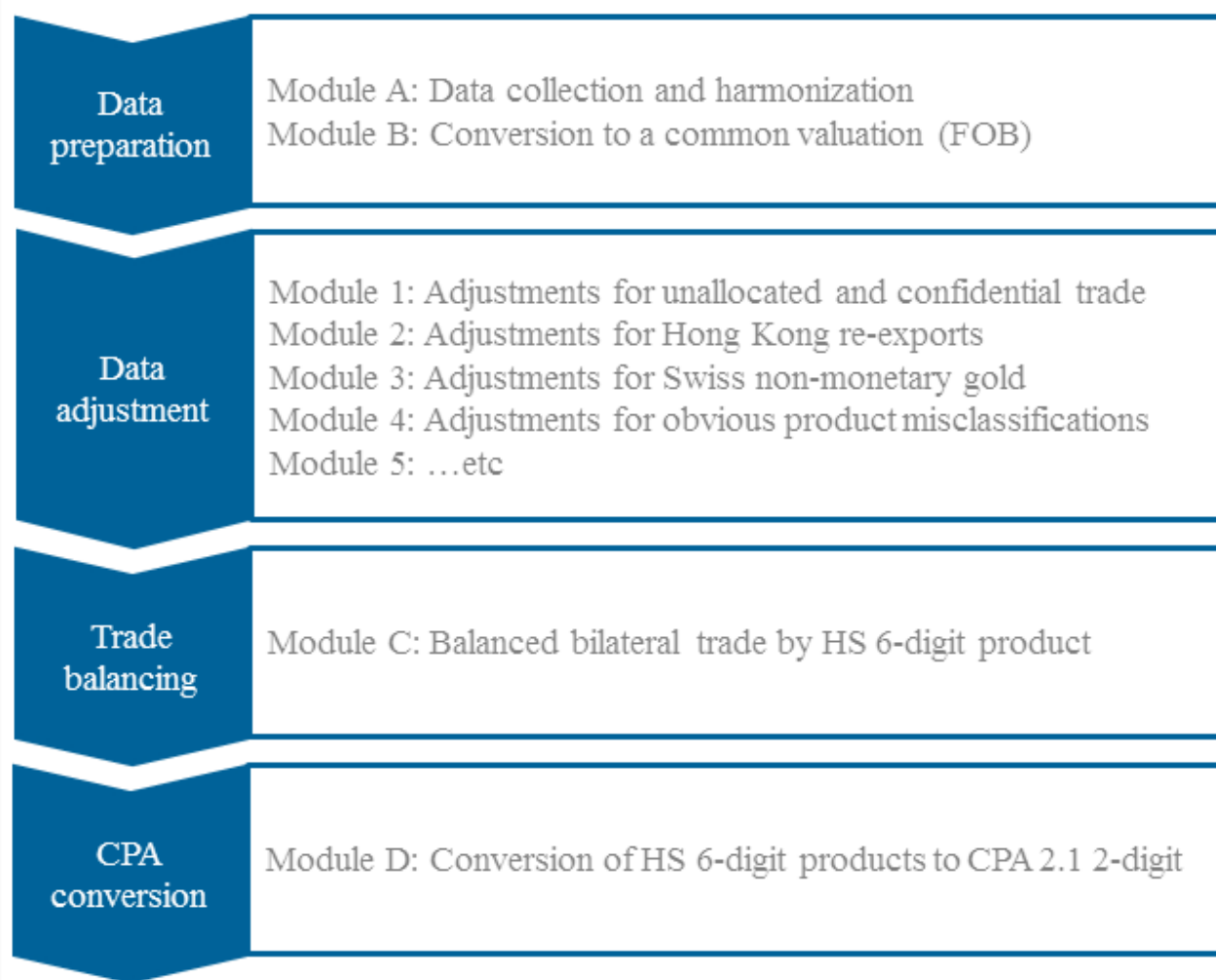
But the most important source of discrepancy is the convention that merchandise trade statistics record imports by country of origin and exports by country of last known destination. This inevitably means that import data will not mirror export data – and the gaps are steadily widening as global production chains become more complex.

Resolving asymmetries – the measure

explained

The OECD has developed a four-step process to reconcile merchandise trade asymmetries (Figure 1). First, data are collected and organised, and imports are converted to FOB prices to match the valuation of exports. Secondly, data are adjusted for several specific large problems known to drive asymmetries. Presently these include 'modular' adjustments for unallocated and confidential trade, for re-exports by Hong Kong, China, for Swiss non-monetary gold, and for clear-cut cases of product misclassifications. The list of modules is expected to grow over time. In the third step, adjusted data are balanced using a 'Symmetry Index' that weights exports and imports, giving a higher weight to the country with less asymmetry in its reported bilateral trade flows. This Index reflects the share of a reporter's bilateral trade for which the absolute difference with the reported mirror flow is 10% or less of the sum of these two flow values. All calculations are made at the detailed product level (HS 6-digit), and the dataset is available at this level. However, in a final step, the data are also converted to Classification of Products by Activity (CPA) products to better align with National Accounts statistics, such as in national Supply-Use tables.

Figure 1. Schematic overview of the steps involved in creating the balanced merchandise trade dataset



As a concrete example of how adjustments are made, take re-exports by Hong Kong, China (hereafter Hong Kong). Hong Kong is a major hub for international merchandise trade, and re-exports account for no less than 96% of its total exports. This leads to large asymmetries, because, following international methodological standards, Hong Kong reports exports to those countries where the products are sent, but the same countries report them as imports not from Hong Kong, but from the country in which they were originally produced.

These asymmetries can be reduced by using the Hong Kong Census Office's detailed 6-digit data on the country of origin of its re-exports. Table 2 illustrates this in the case of data for 2011 on trade in Harmonised System product category 851762 ("Machines for the reception, conversion &

transmission/regeneration of voice, images and other data"). The first data column shows the reported figures by each respective country, and the second column, the adjusted figures. The first column shows that China recorded nearly USD 5 billion of exports to the US, with Hong Kong exporting a further USD 2.1 billion, virtually all of which (USD 1.9 billion) were re-exports from China. In contrast, and consistent with the country of origin principle, the US recorded virtually all of its imports of these goods as coming from China (nearly 9 billion USD), with negligible amounts from Hong Kong. The second column reattributes US imports passing through Hong Kong as imports from Hong Kong, reducing imports attributed to China by the same amount. Note that this does not change China or Hong Kong's reported exports, or the total value of the US's reported imports. But changing the geographical attribution of US imports reduces the asymmetry between China and the US by almost half, and practically eliminates the asymmetry between Hong Kong and the US.

Applying this method reduces asymmetries between Hong Kong exports and partner country imports by 60% overall, and to practically zero for many partner countries. Asymmetries between country pairs like the US and China that trade significantly via Hong Kong are also reduced by 5-10%.

Importantly, by tracking the physical flow of goods, the approach adopted in the database provides a means to better highlight the port and transportation services, related to 'entrepôt' transactions, in trade in value added statistics.

Table 2. Example of trade asymmetries between China and the US where re-exports from Hong Kong are important, before and after re-export adjustment (thousand USD, 2011)

	HS 851762*	HS 851762* adjusted
(1) Exports of China to the US	4 975 623	4 975 623
(2) Exports of Hong Kong to the US	2 097 909	2 097 909
(3) of which re-exports originating from China	1 920 029	1 920 029
(4) Imports of the US from China	9 482 884	7 562 855
(5) Imports of the US from HK	138 023	2 058 052
China-US asymmetry (abs)	4 507 261	2 587 232
Hong Kong-US asymmetry (abs)	1 959 886	39 857

*HS 851762: Machines for the reception, conversion & transmission/regeneration of voice, images and other data

Where to find the underlying data

The database currently contains data for 83 countries for all 2-digit CPA products for the period 2007 to 2014. More countries and years (from 2002 to 2016) will be added in Q1 2018 and updates will be conducted on an annual basis from hereon in. The plan over the next two years will be to accelerate the production process such that the most timely data are available with a lag of no more than one year to the reference period. Further work to reduce asymmetries in official data, including through bilateral and multilateral meetings, is under way in collaboration with national statistical offices and other international organisations.

- Access the database

Further reading

- Miao, G and F. Fortanier (2017), “Estimating Transport and Insurance Costs of International Trade”, *OECD Statistics Working Papers*, 2017/04.

- Fortanier, F (2016), 'Towards merchandise trade statistics without asymmetries', *The OECD Statistics Newsletter*, issue 64.