



Reflecting Methodological Causes of Bilateral Asymmetry for the Forthcoming Revision of IMTS Concepts and Definition

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Abstract:

Statistics are derived from observations – therefore, the quality of observations directly influences the statistical outputs. In many statistical domains, the observations are undertaken by one observer at a given time or reference period (e.g., a survey by the National Statistical Office). However, International Merchandise Trade Statistics (IMTS) flows are usually recorded multiple times in different countries (within the same or different periods). Further, the methodologies to compile trade data may differ. In addition to these, there might be recording errors such as misclassifications or inaccurate trade values. All these give rise to a phenomenon widely known as Bilateral Asymmetries in official statistics, which can be defined as data discrepancies when the reported exports of country A to country B do not match the reported imports of country B from country A.

In the past, the issue of Bilateral Asymmetries has been largely acknowledged as part of the characteristics of trade data. Following the recommendation of the trade manual, countries have been conducting reconciliation studies to describe discrepancies. However, recently, it has become an important quality issue in developing derived trade indicators such as Trade in Value Added (TiVA) or Global Value Chains (GVCs) analysis. It is also utilized to measure a commercial part of illicit financial flows through trade mis-invoicing. Therefore, it is crucial to identify and describe the methodological root causes of Bilateral Asymmetries to include them in the research topic of the forthcoming revision of IMTS Concepts and Definitions (IMTS 2010). The objective is to propose changes and improvements to IMTS methodology to reduce Bilateral Asymmetries and provide better underlying data for its analysis.

Keywords:

Bilateral Asymmetries, Reconciliation Studies, Trade Statistics, Revision of Manual, IMTS

1. Introduction:

The UN Statistical Commission has decided to start the revision process of International Merchandise Trade Statistics, Concepts and Definitions (IMTS 2010) and Manual on Statistics of International Trade in Services (MSITS 2010) in its 52nd session, taking into account the need for consistency with the update of other statistical standards, such as the System of National Accounts and the Balance of Payments and International Investment Position Manual. Due to the increasing importance of bilateral asymmetries for comparable data, notably as input for analytical outputs such as TiVA, GVCs, Trade Mis-invoicing, it is an opportunity to reflect on and assess the current concepts and definitions related to bilateral asymmetries.

To start, various reconciliation studies conducted by countries have identified three main methodological reasons for bilateral asymmetries as follows:

- a) The exclusion of certain type of transactions and the use of different trade systems in data compilation – indicating data gap in product and territorial coverage, respectively
- b) The application of different criteria of partner attribution in import and export statistics – especially in indirect trade
- c) The use of CIF-type and FOB-type values in import and export statistics, respectively – even though some countries compile FOB-type values in import statistics

Therefore, the question is, what possible changes can be applied to IMTS 2010 in terms of the trade system, partner attribution, and valuation to minimize bilateral asymmetries? Other methodological considerations in this regard include informal trade, misclassification of products, imputed values, confidentiality, and goods on consignment.

2. Methodology and Analysis:

Coverage

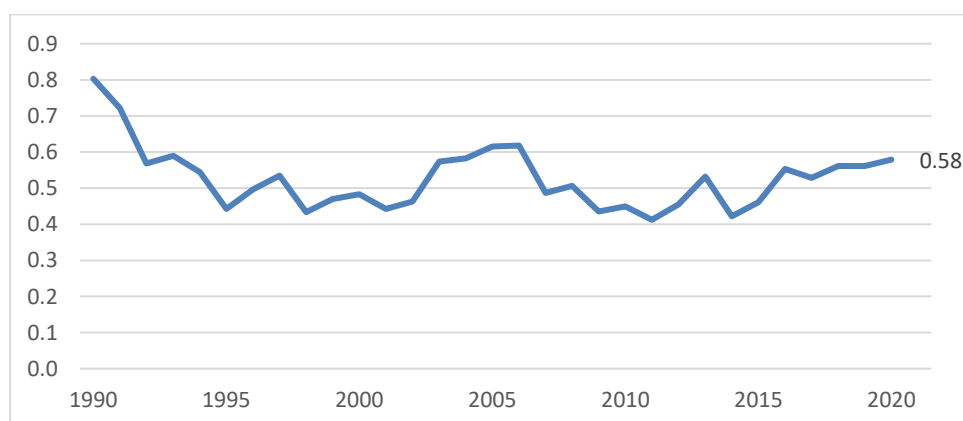
Depending on the national circumstances in the compilation of IMTS or statistical law, certain statistical elements recommended for inclusion in IMTS 2010 may, in practice, be excluded. Even though they are excluded by reporting country, the counterpart/partner country may record these in their IMTS, resulting in asymmetries. Further, because these missing elements are normally included in the Balance of Payments (BOP) trade in goods, it leads to further discrepancy between IMTS and BOP.

The coverage of IMTS statistical elements can be categorized into two major elements:

- a) Nature of transactions, describing inclusion/exclusion in IMTS (see IMTS 2010 paras 1.10 – 1.55)
- b) Coverage of statistical territories, also known as Trade System (see IMTS 2010 Chapter II)

The gap in the recording nature of the transaction is not only due to national circumstances. The analysis of long time-series data highlights a systemic issue in the global compilation practices. For example, the graph below shows consistent discrepancies in the past 30 years in the global trade of SITC Code 793 ship, boat, and floating structure which cannot be explained due to differences in valuation. The reported import figures have always been more or less half of reported exports.

Graph 1. The ratio of World Import to Export of Ships, Boats, and Floating Structures (SITC Code 793), 1990-2020



Source: UN Comtrade Analytics, <https://comtrade.un.org/labs/data-explorer>

Another example is informal cross-border trade, a special kind of small-scale high-frequency transaction not registered in administrative data. Indeed, the IMTS 2010 encourages the estimation of trade below customs and statistical thresholds, if economically significant (para 1.3). And some countries, notably in Africa¹, have attempted to measure informal cross-border trade through surveys for many years. It may introduce bilateral asymmetries among neighboring countries if they are not coordinated – and if the results are not shared among those countries.

On the other hand, the trade system used in a country relates to the coverage of territories for which exports and imports are included in trade data. Countries that use the General Trade System account for trade in all territories, including free zones, territorial waters, enclaves, etc. Countries that use the Special Trade System do not include all territories outside the free circulation area. Bilateral trade asymmetries may arise if either or both trading partners in a given transaction use the special trade system. It might be the case that the transaction was recorded by one partner but not the other.

An example of this phenomenon is the export of gold, diamonds, and platinum (HS Chapter 71) from South Africa. South Africa undertakes the processing of gold by importing gold ores into the inward processing zone and exporting the subsequent resulting processed gold (HS Code 7108). Because of its Strict Special Trade System, South Africa excludes exports from inward processing zones, leading to significant bilateral asymmetries (see table 1 below).

Table 1. South Africa and EU Bilateral Asymmetries of HS 71 (Pearls, precious stones, metals, coins, etc.) in 2019

HS Code	Volume (kg)		Value (US\$)		Discrepancy Ratio
	ZA Exports to EU*	EU imports from ZA	ZA Exports to EU	EU imports from ZA	
71: Pearls, precious stones, metals, coins, etc	n/a	19,252,370	3,102,607,677	9,420,428,823	3.04
7108: Gold, incl. gold plated with platinum	n/a	102,712	n/a	4,522,350,887	n/a
7110: Platinum, incl. palladium, rhodium, iridium, osmium and ruthenium	n/a	90,568	2,592,171,460	3,071,018,858	1.18
7112: Waste and scrap of precious metal or of metal clad with precious metal	n/a	18,726,630	161,707,758	1,030,856,877	6.37
Other HS 71 sub-headings	n/a	332,460	348,728,458	796,202,201	2.28

* Not reported data

Source: African Union Commission Study on Bilateral Asymmetries, 2020

Indirect Trade

Another cause of discrepancies in trade data is the geography of attribution, notably due to indirect trade. With direct trade, goods are shipped from one country to another without intermediaries. However, with indirect trade, goods can be shipped through more than one country, which will cause asymmetry in trade flows. In this case, an exporting country may not know the actual destination country at the time of exportation. In contrast, the importing country would identify the country of origin as recommended by IMTS 2010 para 6.25.

¹ The Informal Cross Border Trade surveys report 2019. The Uganda Bureau of Statistics (UBO) and the Bank of Uganda (BOU), December 2020

To reduce bilateral asymmetries due to indirect trade, it is important to consider the following:

- a) Country of consignment – the last country where a commercial transaction takes place that changes the legal status
- b) Origin of re-exports – the country of origin of goods imported for re-exportation

Indeed, IMTS 2010 para 6.26 has recommended that the country of consignment be recorded for imports for comparable partner data for analytical purposes, including bilateral trade asymmetries. For instance, in the United States-Mexico-Canada Agreement, consider Mexico importing a good from Canada (country of origin, i.e., the commodity originated in Canada), and it was shipped to the US (country of consignment) before entering Mexico. It is possible that the Canadian exporter would be unaware of the country of destination based on its records and could report the importing country like the US instead of Mexico (i.e., the country of consignment and not the country of the final destination). As a result, Mexico would register higher imports value from Canada, which will result in an asymmetry in trade flows. Table 2 and below gives bilateral asymmetries analysis of Mexico imports from Canada and the US, respectively.

Table 2. Mexico Imports – Canada Exports - Southbound Trade (bln US\$)

Concept	2010	2011	2012	2013	2014
A. Mexico reports imports from Canada (FOB)	8.6	9.6	9.9	9.8	10.0
B. Canada reports exports to Mexico (FOB)	4.9	5.5	5.4	5.3	5.1
C. Imports reported by Mexico where the country of origin is Canada and the seller country is the US	3.6	4.1	4.1	4.3	4.5
D. Imports reported by Mexico where the country of origin is Canada and the seller country is outside North America	0.3	0.4	0.3	0.4	0.4
E. Canada adjusted exports (B+C+D)	8.8	10.0	9.8	10.0	9.9
Original Asymmetry (A-B)	3.7	4.1	4.5	4.6	4.9
Adjusted Asymmetry (A-E)	-0.2	-0.4	0.1	-0.1	0.1

Source: INEGI based on NA-TIVA worksheets

In the case of exports, it is essential to identify re-exports, which are exports of foreign goods previously recorded as imports. The re-exports flow determines the existence of indirect trade; therefore, it is important to record the flow, including the origin of re-exports. For example, consider the US exports' statistics include goods that are not of US origin (they might come from a third country) but are re-exported from the US to Mexico. As a result, Mexico would record these goods in its statistics as imports from their country of origin and not from the US, which was only an intermediary trading country.

Table 3. Mexico Imports – US Exports - Southbound Trade (bln US\$)

Concept	2010	2011	2012	2013	2014
A. Mexico reports imports from the US(FOB)	145.0	174.4	185.1	187.3	195.3
B. US reports exports to Mexico (FOB)	163.2	197.8	215.4	225.6	240.6
C. US re-exports	31.8	38.3	41.0	44.4	47.6
D. US adjusted exports 1 (B-C)	131.4	159.5	174.4	181.2	193.0
E. Imports reported by Mexico where the country of origin is the US and the seller country is other	4.5	6.3	7.4	8.7	9.7
F. US adjusted exports 2 (D+E)	135.9	165.8	181.8	189.9	202.7
Original Asymmetry (A-B)	-18.2	-23.5	-30.3	-38.3	-45.3
Adjusted Asymmetry (A-F)	9.1	8.5	3.3	-2.6	-7.4

Source: INEGI based on NA-TiVA worksheets

Nevertheless, data availability from UN Comtrade shows that only very few countries provided the country of consignment information for imports, and a somewhat moderate number of countries provided both country of consignment and country of origin. Thus, progress towards complying with the international recommendation is slow. Whereas for the re-exports, the vast majority of countries provide such information; however, it is important to verify if countries possess the information on the origin of re-exports. It would provide more granular data for the analysis of bilateral asymmetries or other analytical outputs.

Table 4. Availability of Country of Consignment and Re-exports

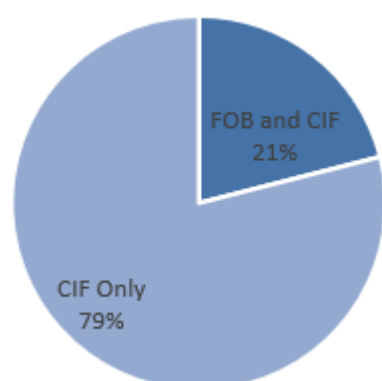
Reported Item	Non-OECD countries	OECD countries
Only country of consignment for imports	4	5
Country of consignment in addition to country of origin for imports	44	19
Re-exports	151	23

Source: Author calculation based on UN Comtrade

Valuation

IMTS 2010 para 4.4 recommends the use of free on board (FOB-type) valuation for exports (border of the exporting country) and cost, insurance, and freight (CIF-type) valuation for imports (border of the importing country). Furthermore, countries are encouraged to compile the FOB-type value of imported goods as supplementary information (para. 4.8). The latter is coherent with the valuation for BOP; however, many countries do not compile FOB-type imports data at the detail level. In the analysis of bilateral asymmetries, certain methods are applied for CIF/FOB conversion to remove the effect of insurance and freight. Graph 2 below shows that 37 countries in UN Comtrade report the FOB and CIF-types valuation data.

Graph 2. Compliance with encouragement para 4.8 (FOB-type imports)



Source: Author calculation based on UN Comtrade

This FOB-type valuation for imports is not in line with the SNA framework, which recommends the market price; therefore, it is considered one of the inconsistencies between SNA and BOP standards. Thus, the Joint Globalization Task Team has drafted the Guidance Note (2020) proposing to use transaction (invoice) value instead of FOB-type valuation. Even though it may not reduce bilateral asymmetries significantly, the new approach would align the BOP/IMTS valuation with the SNA concept of the market price. Also, this would simplify the bilateral asymmetries analysis because adjustments for insurance and freight would no longer be necessary; and would reduce the burden of reporters as the required invoice values should be readily available.²

Challenges of invoice valuation in the compilation of IMTS include:

- a) The treatment of long-term supply contracts.
- b) Availability (and quality) of transaction values in customs records is unclear
- c) Resources to implement the change, including new legal requirements
- d) A possible break in time series (in case of only invoice values being correctly going forward)

In this regard, country consultation and testing are being done to assess (i) the extent of the difficulties in obtaining trade data at observed invoice (transaction) values from customs data, (ii) if this change can be implemented in practice, and (iii) whether the benefits of changing outweigh the disruption (and cost) to the statistical system. Furthermore, an option of collecting invoice values alongside FOB and CIF values may need to be considered.

For benchmarking, the results from the 2016 decennial National Compilation and Dissemination Practices survey on IMTS compilation conducted by the United Nations Statistical Division (UNSD) revealed that 68 out of 102 countries (approximately 67 percent) maintained the invoice price as one of the valuations in basic merchandise trade statistics.³

² See draft Guidance Note of the Joint Globalization Task Team (<https://www.imf.org/-/media/Files/Data/Statistics/BPM6/GZTT/g1-valuation-of-imports-and-exports-of-goods-in-the-international-standards-cif-to-fob-adjustment-up.ashx>)

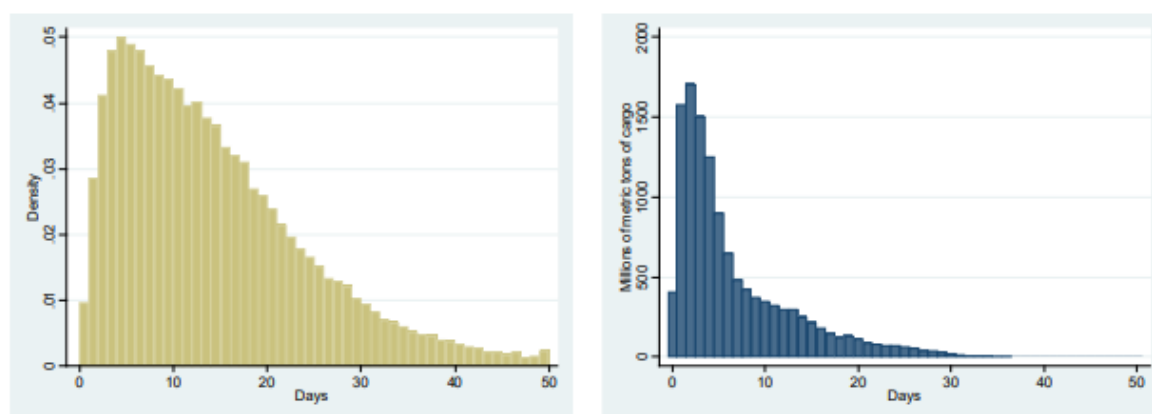
³ See <https://comtrade.un.org/survey/Reports/byQuestion>

Time lag

The time lag in bilateral asymmetries is defined as the differences between the time of recording at the exportation by reporting countries and the time of recording of importation by counterpart country (time lag in shipment/transshipment). The IMTS 2010 clearly indicates that the time of recording should coincide with entering/leaving the economic territory of countries (para 2.22 and 2.27); therefore, bilateral asymmetries due to time lag are expected.

UNCTAD (2017) indicates that more than 80% of merchandise trade by volume and 70% by value is carried by the world vessel fleet. To comply with maritime safety regulation (e.g., IMO, SOLAS), virtually all cargo ships in the world are required to carry a transponder that broadcasts radio signal regularly. It is commonly known as AIS (Automatic Identification System). It contains information about the position, speed, draught, etc., and is collected by terrestrial and satellite receivers.⁴ With these data sets, it is possible to have better estimates of the impact of time lag.

Graph 3. Country-to-country seaborne travel times



Notes: The left-hand-side panel shows the empirical distribution of country-to-country travel times. The right-hand-side panel shows the global volume of trade aggregated by the number of days involved in the corresponding country-to-country voyage.

Source: Diego A. Cerdeiro ; Andras Komaromi, IMF Working Paper No. 2020/284

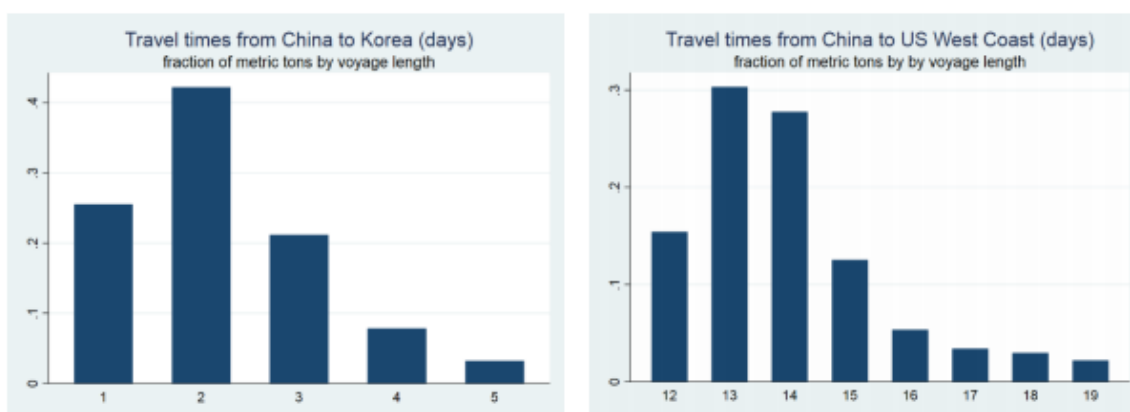
The illustration above shows the distribution of travel times in global shipping:

- a) The panel on the left is a histogram by the number of trips.
- b) The panel on the right is a histogram by volume of cargo.

The study conducted by the IMF (2020) implies that almost all of the world seaborne trade is shipped and delivered within a month. This shows that there will be a lot of trade where exports are recorded a month before imports. Further, based on the chart on the right, almost all exports leaving on the 1st of the month will be recorded as imports that same month. But once 20 days of the month have passed, it is estimated around 1/5 of exports of the reference period will be recorded as imports the following month.

⁴ See more at <http://unstats.un.org/wiki/display/ais>

Graph 4. China to Korea and China to US West Cost seaborne travel times



Source: Diego A. Cerdeiro ; Andras Komaromi, IMF Working Paper No. 2020/284

These differences in the recording will be more relevant for distant country pairs. The top two panels above, in fact, show the bilateral lags between China and (respectively) Korea and the US. For China to Korea, only the very last few days of the month will spill over as imports of the next month. For China to the US, the time lag issue will start around 12 days before the end of the month and become ever more important.

Confidentiality

IMTS 2010 recognized the importance of confidentiality to comply with national rules and legislation. Further, in para 10.30, it is recommended to apply passive confidentiality (apply confidentiality only when requested). The data extracted from UN Comtrade Analytics from 1990-2020 shows that around 0.6% of global shares have confidentiality applied to both commodity and partner. Moreover, it shows that confidentiality applied mostly to suppress information on commodity instead of partner (3.3% and 0.9% of the global share, respectively). The common use of the bilateral asymmetry studies is to analyse the discrepancies by commodity and partner; therefore, it is important to apply the recommendation of IMTS 2010 para 10.3 that confidentiality should be relaxed at the higher level of aggregates.

Table 5. The global average share of a combination of unknown commodity and partner

	Commodity not elsewhere specified (NES)	All Commodities
Partner NES	0.6%	0.9%
Partner World	3.3%	100.0%

Source: UN Comtrade Analytics, <https://comtrade.un.org/labs/data-explorer>

3. Results and the Way Forward:

Based on the issues described in earlier sections, aiming to reduce bilateral asymmetries and to provide more granular data for its analysis, the table below shows the potential amendment to IMTS 2010 and input for the compilation guide to address specific challenges.

Table 6. Proposal for amendment or clarification

Item	Current Recommendation	Option for Future Recommendation	Compilation Consideration
Nature of Transaction Inclusion/Exclusion	The detailed list of inclusion/exclusion	Clarification for certain transactions ensuring consistent methodology	Elevating the possibility of micro-data exchange notably in certain transactions such as Informal Cross Border Trade
Territorial (Trade System)	General Trade System – and recognition of Special Trade System	Reducing/Removing reference to Special Trade System ensuring that statistical territories equal to economic territories	Technical assistance to compile General Trade System including estimation techniques
Country of Consignment	Compiling country of consignment in addition to country of origin for Imports	Clarification of the importance of country of consignment for analytical datasets (i.e., TiVA) and Bilateral Asymmetries	Strengthening technical assistance to compile country of consignment
Origin of re-exports	Not applicable	Adding new data item to identify the origin of re-exports	Each re-export should have the corresponding imports. Therefore, the basic information of the origin of re-exports should be available
Transaction value	Not applicable	Adding valuation of transaction value in addition to CIF/FOB valuations	The survey and test conducted by the Joint Globalization Task Team should inform readiness to compile transaction value. The CIF to FOB adjustment and the change to transaction values for the valuation of imports and exports have different impacts according to national circumstances
Time lag	No change	Not applicable	To promote the use of alternate data sources such as AIS when conducting a reconciliation study
Confidentiality	The use of passive confidentiality	No change	Encourage less application of strict confidentiality rules at a higher level of aggregates

4. Discussion and Conclusion:

Thanks to the forthcoming revisions of BPM6, 2008 SNA, IMTS 2010, and MSITS 2010, it is now feasible to directly address the long-standing known phenomena of bilateral asymmetries in IMTS and MSITS. Even though it is impossible to eliminate 100% of the asymmetries, the global community should take advantage of the revision cycle to identify conceptual issues contributing to the bilateral asymmetries and propose an amendment in the manual or provide detailed compilation guidance countries to reduce the discrepancies. And in addition, it also allows data providers and users to analyse bilateral asymmetries in a more structured manner. This would lead to a better analytical output such as TiVA, GVC, or trade mis-invoicing.

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