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BOPCOM—25/08
For discussion

# Interim Report of the Task Team on Global Asymmetries

Prepared by the Statistics Department

INTERNATIONAL MONETARY FUND

# Progress Report of the Task Team on Global Asymmetries[1]

*The Task Team on Global Asymmetries (TT-GA) has concentrated its efforts on identifying asymmetries in key areas of external sector statistics. Its objectives include cataloging existing work on asymmetries, pinpointing major sources of discrepancies, identifying analytical tools to support asymmetry assessments, and offering initial recommendations to address them. This interim report summarizes the TT-GA's progress since the 2024 BOPCOM meeting, presenting a set of preliminary recommendations. It also outlines the proposed next steps for the coming year, during which the team will continue its analysis and refine its recommendations.*

## INTRODUCTION

1. Persistent global asymmetries in external sector statistics (ESS) complicate the interpretation of global statistics, impact the credibility of official statistics, and pose challenges to multilateral surveillance.[2] The Task Team on Global Asymmetries (TT-GA) was established to investigate and make recommendations to the IMF's Committee on Balance of Payments Statistics (BOPCOM) on how to reduce global asymmetries in external sector statistics (ESS) as well as address bilateral asymmetries between economies.

2. Addressing global asymmetries requires a multifaceted and collaborative approach, recognizing that these discrepancies stem from diverse methodological, statistical, and practical challenges. While complete elimination of asymmetries may not be feasible due to the inherent complexities of international transactions and differences in national statistical systems, targeted actions can substantially improve the quality, comparability, and reliability of ESS.

3. Since the last update to the Committee in November 2024, the TT-GA has organized its work into six workstreams[3] as presented in its 2025 work plan. Workstreams 1 to 5 aimed to document key sources and known causes of asymmetries relating to specific components of the ESS; take stock of existing initiatives to understand and address asymmetries; and develop preliminary recommendations to address them. For emerging areas of interest, such as the treatment of global production arrangements and third-party holdings of securities, the focus has been on researching the issue and exploring the impact on asymmetries, while developing recommendations as feasible. Workstream 6 focused on exploring

[1] The preparation of the report was primarily undertaken by Ms. Evrim Bese Goksu and Ms. Erin Nephew (Task Team Secretariat), Ms. Kristy Howell (Task Team Chair), and workstream leads, Messrs. Robert Leisch, Dilip Ratha, Jorge Diz Dias, Fernando Lemos, and Esmond McLean and Ms. Evis Rucaj, drawing from inputs prepared by each workstream. The work benefitted from comments by Messrs. Carlos Sánchez-Muñoz (Chief, Balance of Payments Division), Jannick Damgaard, Bedri Zymeri, and Malik Bani Hani and Ms. Haruko Sakai (all Balance of Payments Division). A special thank you to Mmes. Maja Gavrilovic and Silvia Amiel and Messrs. Mher Barseghyan, Topias Leino, and Patrick Quill (all Balance of Payments Division), for important contributions and support to the task team, including data analysis.

[2] See Box 1.1, Measuring Current Account Balance, in the IMF's 2025 External Sector Report.

[3] Workstreams were established to cover: (i) trade in goods and services (including focus on digital trade and global production arrangements); (ii) personal transfers (focus on remittances); (iii) securities (focus on third-party holdings); (iv) foreign direct investment (focus on equity and debt positions); (v) other investment (focus on external debt statistics); and (vi) tools to address asymmetries (including AI-based methods).

tools for identifying and communicating asymmetries and assessing their applicability across different areas.

4. Despite their shared objective, the workstreams approached the work differently depending on the maturity of prior work in their area and the extent of information available. For some workstreams, more upfront work was required just to establish the level of asymmetries for their area of focus, including comparing different global datasets and digging into the bilateral asymmetries. Others focused on presenting the previous work done in their respective areas through extensive literature reviews, which shed light into the remaining areas of work. Most workstreams cast the net wide in terms of the recommendations, mainly focusing on their potential benefits. To that end, further work will include cost/benefit analysis to refine and prioritize the recommendations, for which the Committee's input will be sought. This diversity of approaches has enriched the analysis but also means that, at this stage, recommendations vary in maturity and scope.

5. The TT-GA aims to further develop the recommendations and present to the Committee a more refined list of recommendations for its 2026 meeting with an emphasis on feasibility, prioritization, and alignment with member countries' needs.

6. The **first section** of this report provides an updated analysis of the current state of global asymmetries, the **second section** presents a summary of the major sources of asymmetries, and some preliminary views on how to address them, while the **third section** proposes a way forward. The detailed initial findings of each workstream are presented in Annex I. The TT-GA's preliminary recommendations are provided in Annex II and a stock take of previous studies and initiatives are listed in Annex III.

## I. OVERVIEW OF GLOBAL ASYMMETRIES

7. To investigate asymmetries, the TT-GA has followed a top-down approach—first examining asymmetries at the global level, including discrepancies in the global current account, capital account, and financial account, and global external position, and then drilling down into the components that contribute significantly to those global asymmetries.[4] These components became the workstreams for the TT-GA, with each team lending their expertise to explore these components more closely. Where feasible, some workstreams also examined bilateral asymmetries, to try to understand how asymmetries between partner countries contribute to the global asymmetries.

8. The TT-GA's first progress report to BOPCOM in November 2024[5] summarized the current state of global asymmetries through 2022, drawing from the IMF's annual Balance of Payments and International Investment Position, World and Country Aggregates publication (known as BOPSY).[6] The

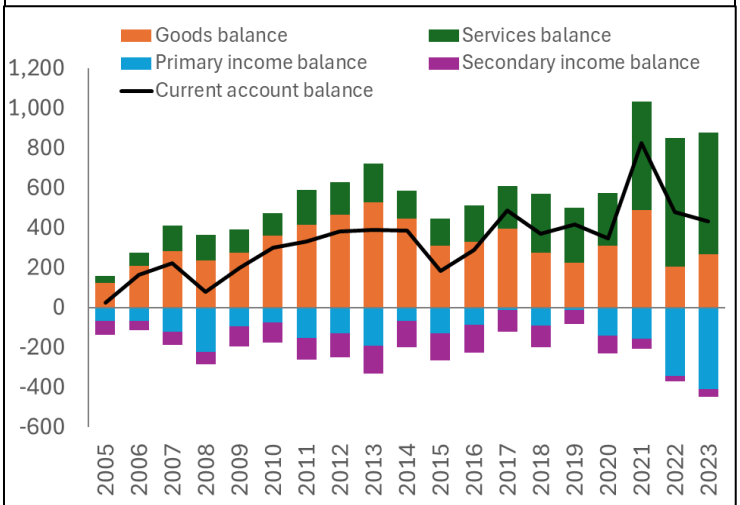
[4] The TT-GA agreed to focus initially on position data before turning attention to financial flows and related investment income transactions, for which bilateral data is more limited.

[5] BOPCOM 24/08

[6] The World and Country Group Aggregates is an annual publication, released each November, of major balance of payments and international investment position components for countries, country groups, and the world. Data in these tables are based on information provided directly to the IMF by country compilers and international organizations. To allow for regional aggregation, data for missing countries are estimated by IMF staff to the extent possible.

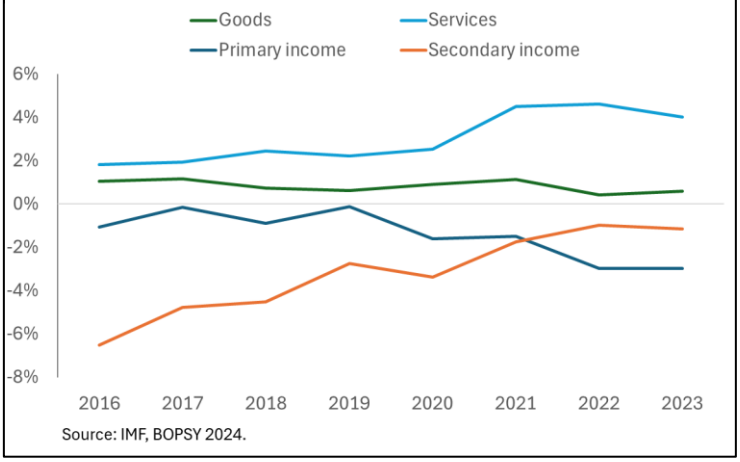
latest figures confirm that overall trends remain aligned with previous data.[7] The global current account balance (reflecting the difference between current account receipts and payments) has been consistently positive. Following a peak in 2021, it has decreased the last two years. The global financial account has been mostly positive over the past decade, indicating more financial outflows than inflows at the global level; this trend also continued in 2023. At the same time, the global net international investment position (IIP) has been historically negative (reflecting more external liabilities than assets) and increasing in absolute terms since 2018. The drivers behind these asymmetries are discussed below.

**Figure 1. Composition of Global Current Account Asymmetries, 2005–2023, Billions of U.S. Dollars**




Source: IMF, BOPSY 2024, IMF staff calculations.
Note: Includes estimates for missing countries, which account for around 2.4 percent of total current account flows in recent periods.

**Figure 2. Net Global Current Account Asymmetries, 2016–2023, Percent of Total Transactions (Credit + Debit)**




Source: IMF, BOPSY 2024.

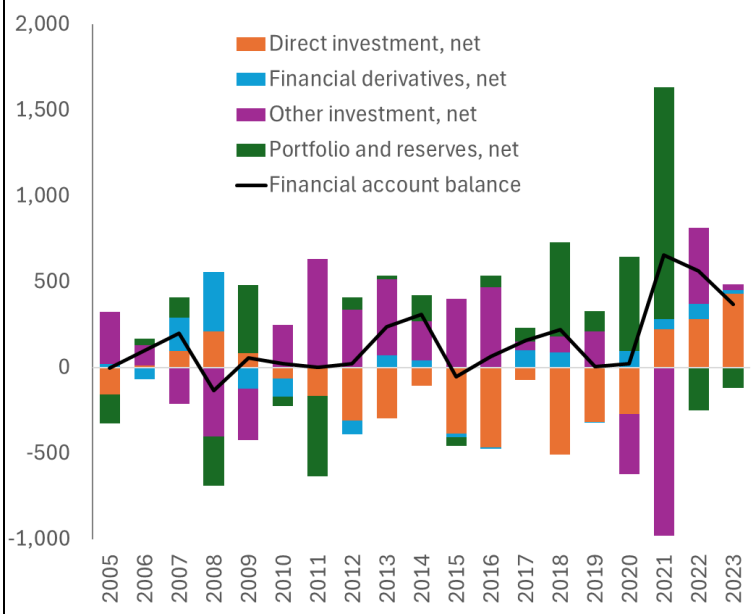
### Asymmetries in the Balance of Payments

9. As shown in Figure 1, the global current account asymmetry reflects persistent positive discrepancies in goods and services trade (indicating global exports consistently exceeding imports), partly offset by persistent negative discrepancies in primary and secondary income (indicating global payments consistently exceeding receipts). The current account discrepancy was largely driven by the global goods discrepancy over most of the period analyzed (2005 to 2023), but the discrepancy in services has grown to exceed the discrepancy in goods in recent years. Meanwhile, the negative discrepancy in primary income has increased significantly in the past two years, which has contributed to the lower overall current account asymmetry.

10. While secondary income remains the smallest component of the global currency account asymmetry in terms of value, it is significant in relative terms, with the asymmetry as a percentage of total

[7] These results were also discussed in the Balance of Payments Committee 2024 Annual Report.

**Figure 3. Composition of Global Financial Account Asymmetries, 2005–2023, Billions of U.S. Dollars**




Source: IMF, BOPSY 2024.

Note: Net portfolio investment and reserve assets are shown together because a significant portion of reserve assets are debt securities for which the counterpart liability would be recorded as portfolio investment. This comparison is, of course, imprecise given that some counterpart liabilities to reserve assets would be under other investment; in addition, reserve assets includes any transactions in monetary gold bullion, which do not have a counterpart liability.

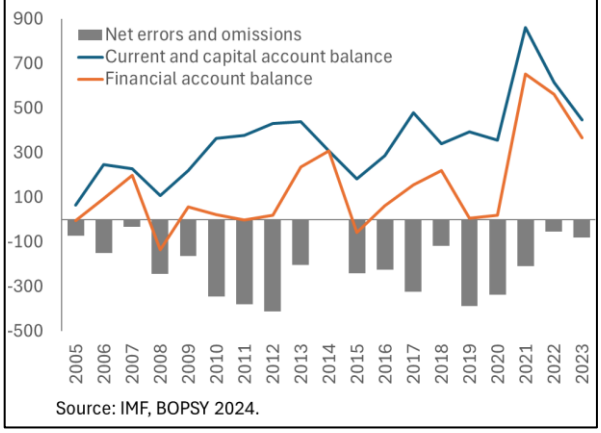
transactions (credits plus debits) exceeding 6 percent in 2016 before declining to under 2 percent in recent years (see Figure 2).

11. Figure 3 shows a similar decomposition of the global financial account balance, which should be zero by definition, given that all financial assets (except for holdings of monetary gold bullion) should have a counterpart liability. Here the patterns are not so persistent. This is likely because gross flows can switch between inflows and outflows in any given period. However, there are often offsetting asymmetries across functional categories, suggesting that in addition to gaps or mismeasurement, there may also be some asymmetric classification of transactions by functional category (e.g., one partner records the transaction as direct investment while the other records it as other investment).

12. Since 2005, net lending/net borrowing derived from the current and capital account[8] has exceeded net lending/net borrowing from the financial account in every period except for 2014 (see Figure 4, next page). As a result, net errors and omissions have mostly been negative over the past two decades. By convention, negative net errors and omissions (or, the statistical discrepancy) indicate an overall tendency that (a) the value of credits (inflows) in the current and capital accounts may be overstated; (b) the value of debits (outflows) in the current and capital accounts may be understated; (c) the net acquisition of financial assets may be understated; and/or (d) the net incurrence of liabilities may be overstated (see *BPM7*, paragraph 2.25).

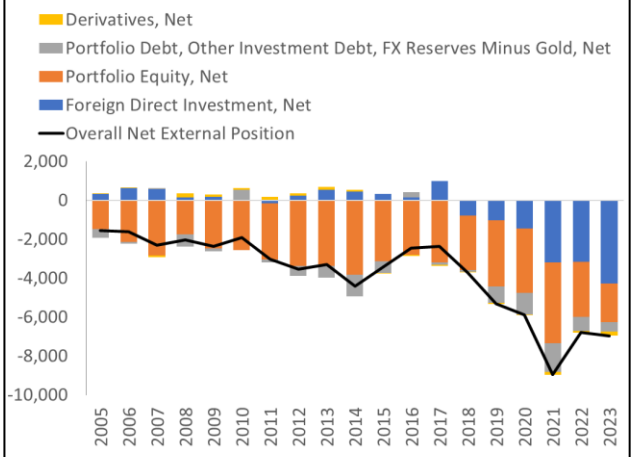
[8] The TT-GA has not focused on asymmetries in the capital account, which tend to be small (accounting for, on average, 8 percent of net lending/net borrowing from the current and capital accounts in the last 10 years). Given the nature of capital account transactions, the asymmetries are likely to reflect asymmetric recording of irregular transactions.

**Figure 4. Composition of Global Balance of Payments Asymmetries, 2005–2023, Billions of U.S. Dollars**




Source: IMF, BOPSY 2024.

**Figure 5. Composition of Global External Position Asymmetries*, 2005–2023, Billions of U.S. Dollars**




Source: Milesi-Ferretti, Gian Maria, 2024, "The External Wealth of Nations Database," The Brookings Institution (based on Lane, Philip R. and Gian Maria Milesi-Ferretti, 2018, "The External Wealth of Nations Revisited: International Financial Integration in the Aftermath of the Global Financial Crisis," IMF Economic Review 66, 189-222.)

*FX Reserves are included in Debt Assets.

### Asymmetries in Global External Positions

13. Figure 5 shows the composition of global asymmetries in external position statistics, derived from the External Wealth of Nations (EWN) dataset.[9] The EWN provides estimates of each country in the world's external financial assets, liabilities, and net IIP (NIIP), excluding monetary gold bullion.[10] It sources the information primarily from countries' BOP and IIP and related data disseminated by the IMF while expanding time series and country coverage using alternative data and methods. Using the EWN, Milesi-Ferretti (2023) identifies similar trends in global asymmetries, and points out that, while "[balance of payments] statistics highlight a positive 'global discrepancy,' …recording net global accumulation of financial assets abroad, [estimates from the EWN] of global NIIPs highlight a growing negative discrepancy. Recorded global external liabilities have risen faster than global recorded assets, even though recorded global net lending abroad has been positive throughout the decade." Milesi-Ferretti (2023) then attempts to account for the widening discrepancy between external asset and liability positions using additional data for the United States and European economies to estimate valuation and other changes, which are also impacting external positions. Consistent information for all countries on changes in valuation and other changes (for example, as presented in the integrated IIP statement) is needed to dig deeper into this apparent puzzle.

[9] See https://www.brookings.edu/articles/the-external-wealth-of-nations-database/. Note that EWN is used because the published BOPSY dataset lacks sufficient detail to analyze external position asymmetries by functional category.

[10] Monetary gold bullion is excluded because it does not have a counterpart liability.

## II. MAJOR SOURCES OF ASYMMETRIES AND WAYS ADDRESS THEM

### Major Sources of Asymmetries

14. While the reasons for asymmetries may differ across the components of external sector statistics, there are a number of common factors that tend to affect most of these components. These are summarized below. Over the next year the TT-GA will aim to further quantify the impact of these different sources of asymmetries, to the extent feasible.

15. **Data gaps and under coverage.** Asymmetries at the global level are partly due to gaps (e.g., missing countries) in global datasets. For example, the IMF's data on BOP and IIP are often used to assess the magnitude of global asymmetries since the dataset has broad coverage of most countries based on reporting to the IMF; but even these data do not give us the true value of asymmetries since some countries do not report.[11] Gaps in bilateral datasets are even more significant, which complicates efforts to understand the global asymmetries because comprehensive comparisons cannot be made at the partner-country level (bottom-up approach). In addition to data gaps due to missing countries, under-coverage of certain transactions or sectors can also contribute to asymmetries. For example, the household sector or informal sector may be under covered, and holdings of securities by custodians or in offshore centers may not be fully captured.

16. **Deviations from international standards.** Asymmetries can arise due to incomplete alignment with the latest international methodological standards. Incomplete adoption of the change-of-ownership basis in *BPM6,* for example, leads to asymmetries in global current account statistics. Many recommendations reflected in *BPM7* are intended to address asymmetries.[12] For example, the integrated IIP is made central in *BPM7*, becoming part of the standard components, with expanded details about certain other changes. This detailed statement presenting the reconciliation of stocks and flows can help to improve consistency between IIP and BOP data, which should also support the reduction of asymmetries.[13] At the same time, there is also potential for asymmetries to increase in the short term as countries begin to adopt *BPM7* with varying timelines.

17. **Asymmetric treatment inherent in the international standards.** In a few cases, asymmetries are a direct result of the asymmetric recording of certain transactions prescribed in the international standards. For example, the recording standards of *BPM6* create bilateral asymmetries for certain transactions related to goods under merchanting (see Box 3, below). For International Merchandise Trade Statistics (IMTS) basis goods trade, the valuation of exports (at free-on-board) and imports (including cost, insurance, and freight) and the partner country attribution of exports (to the country of last known destination) and imports (to the country of origin) are well-known examples. For foreign direct investment (FDI), bilateral asymmetries can result in some cases from the treatment of fellow enterprises when data

[11] For the BOPSY 2024, 195 economies (including 179 IMF members, 13 economies that are non-IMF members, and three currency unions) reported BOP data, while 173 also reported IIP data. Countries report BOP and IIP data to the IMF's Statistics Department on a voluntary basis.

[12] In addition, the use of invoice values as the basic principle for valuing imports and exports of goods, while not adopted in *BPM7*, is anticipated for the next version of the manual, and is expected to reduce asymmetries in goods trade statistics that stem from challenges to estimate the CIF-FOB adjustment (see discussion in Annex I).

[13] At least 95 countries already compile the integrated IIP statement, according to metadata submitted to the IMF, although the level of detail may vary.

are compiled based on the directional principle (however, at the global level the asymmetries offset each other).[14] These kinds of asymmetries can usually be understood and accounted for in asymmetry analyses with some additional information or adjustments, but it is nonetheless important to be aware of their contribution to asymmetries.

18. **Differences in estimation methods and source data.** Even if compilers align their statistics with the latest international standards, discrepancies will persist due to the use of different estimation methods, data sources, and classification systems. For example, in the case of FDI, the use of different valuation methods, mainly for unlisted equity, can produce large asymmetries. Differences in the time of recording of transactions (e.g., time of invoicing vs. customs clearance for goods trade) can also result in asymmetries.

19. **Differences in partner country attribution.** At the bilateral level, partner country attribution errors, are a recurring issue. For example, goods are sometimes incorrectly assigned to intermediate countries rather than final destinations, especially in complex supply chains involving merchanting, re-exports, or transit trade. Differences in partner country attribution are also common in investment, where complex ownership structures and the use of special purpose entities (SPEs) can often result in asymmetric information available to compilers on either side of a transaction. Differences in the territorial definitions applied by partner countries may also give rise to asymmetries at the bilateral level. These differences in partner country attribution may cause bilateral asymmetries, but they generally do not lead to global discrepancies, since they tend to offset each other.

**Addressing the Asymmetries: Preliminary Views**

20. Based on the initial findings of the workstreams including through a review of recent studies and international best practices, the TT-GA has developed some preliminary views about how the asymmetries can be addressed and some preliminary recommendations, presented in Annex II. Where common themes have emerged, some cross-cutting recommendations have been identified.

21. The recommendations are preliminary as they are intended as an initial framework to guide action, but not as a definitive set of solutions. They will be further refined and adjusted as the TT-GA's work advances, and additional lessons are drawn from country practices and international collaboration. This iterative process is central to ensuring that the recommendations remain both relevant and practical over time. Building on these ideas, the workstreams will continue to develop a set of specific recommendations over the next year, taking on board inputs from BOPCOM, including on prioritization.

22. Some of the recommendations could be targeted in the short to medium term and could be undertaken by the TT-GA or other relevant statistical working groups (such as conducting a further stocktaking exercise with selected countries) while other recommendations would be more medium term or would require engagement with other stakeholders to develop targeted mechanisms to address coverage issues and would be directed at the broader international statistical community, including compilers and the relevant international organizations. Other recommendations will be aimed at promoting consistency of methodological interpretation across jurisdictions and strengthening international cooperation frameworks. Recognizing that some asymmetries are inherent and cannot be fully eliminated, ongoing monitoring, transparency in reporting, and continuous methodological refinement

[14] Core accounts in the IIP remain consistent in any case. See discussion in Annex I.

are also necessary. The recommendations could be summarized around the following themes, which are relevant for most areas of asymmetries.

23. **International Collaboration.** Enhanced cooperation through bilateral and multilateral reconciliation studies, data-sharing agreements, and participation in international working groups (e.g., IMF, Eurostat, OECD) is essential. These efforts help harmonize methodologies and facilitate the exchange of best practices. Focused bilateral studies and data exchanges in high-asymmetry sectors can help identify and resolve specific discrepancies.

24. **Standardization of Methodologies.** Full adoption of international standards (e.g., *BPM6*, *IMTS*, *BD4,* and in future the *BPM7, IMTS 2026,* and *BD5*) and harmonization of geographical definitions are critical. General efforts by individual economies to improve the quality of ESS and to align with the latest international standards should support a reduction in global asymmetries.

25. **Enhanced Global Data Collection.** Intermediate steps could be taken to improve coverage in the existing global datasets, while the medium-term proposals can be developed to further enhance data collection and reporting to reduce gaps in the existing datasets, which will facilitate understanding of asymmetries. In the short term, more timely submission of data to global databases would also enable international organizations to monitor asymmetries more effectively.

26. **Improved Data Collection and Survey Design.** Regular updates to data systems and methodologies are needed to keep pace with evolving patterns in trade, investment, and remittances. Expanding survey coverage, especially for small enterprises and to account for digitalization, and refining survey instruments can improve data quality. International organizations can play a role in supporting these kinds of improvements through capacity building.

## III. WAY FORWARD

27. Building on these initial findings, the TT-GA will continue its work on identifying asymmetries and coming up with recommendations to address asymmetries in ESS. Taking on board comments and inputs from Committee members and other relevant stakeholders, the TT-GA, through its workstreams, will further refine the recommendations presented in this paper. This may require further outreach to national and regional data compilers as well as international organizations. A cost/benefit analysis may be conducted to understand the feasibility of the recommendations and for their prioritization.

28. The TT-GA will present its first full set of recommendations to the Committee at its meeting in the fall of 2026 along with a proposal for the future of the TT-GA.

***Questions for the Committee:***

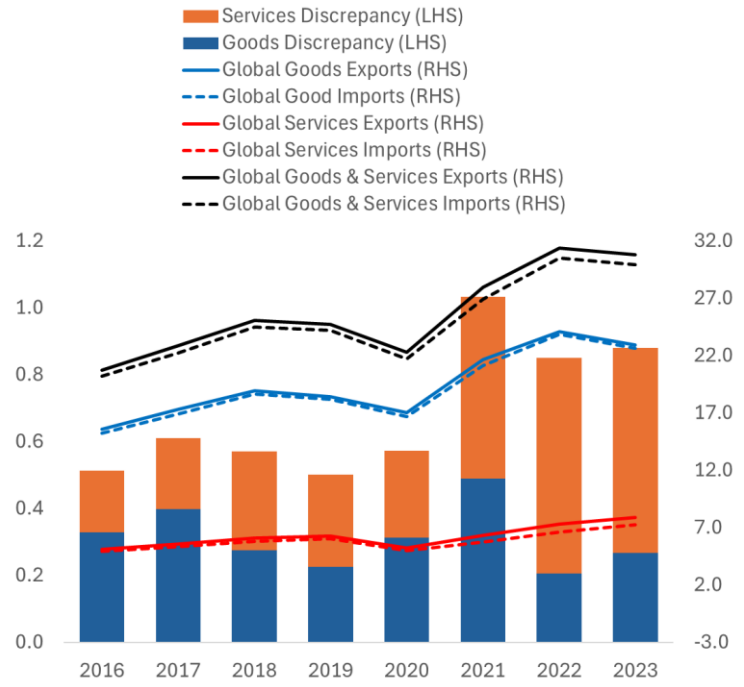
1. *What are the Committee members' views on the general direction of the TT-GA's work?*
2. *What are the Committee members' views on the preliminary set of recommendations?*
3. *Do Committee members agree with the proposed way forward?*

## Annex I. TT-GA's Detailed Findings on Asymmetries in Major Components of ESS

### GOODS AND SERVICES TRADE[15]

1. Despite various efforts to tackle them at the national and international level, global asymmetries in trade statistics persist and remain a primary driver of overall current account asymmetries, with direct implications for assessing global imbalances and the credibility of trade statistics. Globally, exports of BOP goods and services are consistently larger than imports of BOP goods and services (see Figure 6).

**Figure 6. Global Goods and Services Exports and Imports, 2016–2023**
**Trillions of U.S. Dollars**




Source: IMF, BOPSY 2024.

2. The TT-GA reviewed a number of studies which looked into the asymmetries in trade in goods and services. The discussions below are a culmination of the studies reviewed.

3. Discrepancies between reported exports and imports of goods and services are common across countries and regions, driven by differences in statistical methodologies, data collection practices, and deviations from *BPM6* recording standards due to practical reasons and different reporting systems. Methodological differences, such as variations in classification and estimation methods, are consistently identified as key contributors to asymmetries.

4. Globally, the same pattern persists for goods and services separately, with exports consistently exceeding imports. For BOP-basis goods this is true even though BOP-basis goods exports and imports should be based on common valuation (FOB).[16] This persistent positive discrepancy is likely driven in part by differences in the application of the CIF-FOB adjustment (see Walters, 2018).

5. For trade in services, it is likely that reported exports are higher than imports because exports are inherently easier to measure, given they tend to be more concentrated and therefore easier to collect in

[15] This section was prepared by WS1, comprising the following members: Mr. Robert Leisch (lead), Ms. Jennifer Bruner, Mr. Jörg Feuerhake, Mr. David Brackfield, Ms. Ilda Duarte Fernandes Meyer, Mr. Markie Muryawan, Ms. Ying Yan, Mr. Chris Goldsworthy, Ms. Can Yang.

[16] For International Merchandise Trade Statistics (IMTS) basis goods, on the other hand, global imports tend to exceed global exports, in part because imports are valued at cost, insurance, and freight (CIF) while exports are valued at FOB.

an exhaustive way (Garber et al, 2018). Imports of services are, in general, more difficult to compile, particularly if enterprise surveys are the primary source of information (ONS, 2022). Importers are often more numerous and smaller entities, falling below survey thresholds, and are harder to identify compared to exporters.

6. A significant finding across the studies reviewed is that trade in services exhibits, in relative terms, higher asymmetries than trade in goods. Categories such as financial services, other business services, and charges for the use of intellectual property are frequently cited as areas with substantial discrepancies in absolute or relative terms. The rise of digital trade, including streaming services and e-commerce, adds further complexity to measuring services trade.

7. At the bilateral level, partner country attribution errors, where goods or services are incorrectly assigned to intermediate countries rather than final destinations, are a recurring issue.

8. These challenges are compounded by the intangible nature of services, which makes them more prone to classification differences and partner attribution errors.

9. Despite the challenges associated with addressing asymmetries, previous studies have emphasized the importance of international collaboration to address asymmetries. Bilateral reconciliation studies, data-sharing agreements, and participation in international working groups are recommended as effective strategies to improve data quality and comparability.

10. Much progress in addressing trade asymmetries has been centered in Europe. An annual report of Eurostat takes stock of the level and extent of asymmetries in BOP data and since 2022 Eurostat has organized the Asymmetry Resolution Mechanism for Trade in Services (ARM ITSS). Through the ARM ITSS, Eurostat prioritizes intra-EU cases, identifies the most relevant asymmetries, and then arranges for trilateral reconciliation meetings to resolve the asymmetries. Eurostat provides a secure platform for exchanging confidential information, and shares follow-up information with all countries to promote peer learning. Through these efforts, 8 of the 26 ARM cases are now considered resolved, and visible improvements have been achieved for most of the remaining 18 cases. Work is ongoing to develop a handbook on ITSS asymmetries that will include more detailed explanations for specific asymmetries for certain services transactions. The ARM ITSS provides a strong model of structured bilateral reconciliation that could also be adapted outside Europe. Eurostat recently conducted a workshop and developed guidance on the proper treatment of non-resident VAT traders (see Box 1). The Travel Workshop is another large international group, initiated by Eurostat, which focuses on methodological and conceptual discussions, in this case related to travel and tourism, and hosts bilateral asymmetry meetings.

11. The East African Community External Sector Statistics Working Group also regularly analyzes bilateral trade data to identify key products and issues causing discrepancies. This approach has already encouraged cooperation among member states and set the stage for improving how trade data is collected, processed, and reported.

12. Since 2016, the OECD has conducted regular bilateral trade asymmetry meetings on the sidelines of its Working Party on Trade in Goods and Services meetings, and in 2022 formed the Informal Experts Group on International Trade in Services Compilation and Asymmetries, which serves as a collaborative platform for experts to share best practices in compiling trade in services statistics, identify the causes of asymmetries, and work collectively to improve data quality.

**Box 1. Treatment of Non-resident VAT traders (NR-VATT) in the European Union**

NR-VATT are entities that are registered for VAT in one European Union Member State and that do not have a physical presence (no employees, no premises, and no production activities) and are legally domiciled and incorporated in another EU or non-EU country. Therefore, they do not fulfil the *BPM6* residency criteria and have to be treated as non-resident units in the country where they are created for VAT purposes. The establishment of such entities is driven by the requirements of the EU VAT legislation that foresees a separate VAT registration for enterprises intending to conduct business in another Member State.

The activities of NR-VATT are often related to physically moving goods to, from, or within the Member State or a non-EU country for purposes related to warehousing, customs clearance but also for merchanting and global production arrangements that are conducted on behalf of their parent enterprise abroad. For BOP purposes all transactions carried out by NR-VATT abroad have to be combined with their parent enterprise. The physical cross-border movements of goods by NR-VATT are recorded in IMTS and have to be excluded for compiling BOP exports and imports of goods according to *BPM6* recording standards from the perspective of the country where the NR-VATT is registered for VAT because no change of ownership between a resident and non-resident unit takes place. However, NR-VATT also transact with resident units in the country where they are established for VAT. These activities involve a change of ownership and need to be included in BOP but are not recorded in IMTS because no physical cross-border movement takes place.

The correct treatment of NR-VATT in BOP statistics is a crucial aspect of the EU statistical framework. Eurostat aims to ensure that BOP data collected from the EU Member States accurately reflects the economic activities of NR-VATT in accordance with the *BPM6* change of economic ownership principle.

Eurostat conducted a workshop in Spring 2024 and developed guidance on the proper treatment of NR-VATT by drafting methodological note 17. As a result of this workshop, some EU Member States started to make adjustments for NR-VATT in their 2024 benchmark revision. Based on intra-EU IMTS and BOP export and import values for reference year 2023, adjustments for NR-VATT are carried out by 11 out of the 27 Member States. In numerical terms these adjustments are by far the largest corrections to IMTS and contribute significantly to reducing asymmetries in the intra-EU BOP goods account.

13. In previous studies reviewed by the TT-GA, organizations like the IMF, Eurostat and the OECD are highlighted as key facilitators in fostering cooperation and standardizing methodologies. However, recent studies also acknowledge that while asymmetries can be reduced, they cannot be entirely eliminated due to the inherent complexities of international trade and differences in national statistical systems.

**Major Sources of Asymmetries**

14. The trade workstream primarily focused on the extensive work that has been undertaken previously to understand bilateral (or, in some cases, trilateral) asymmetries in trade in services. While the studies broadly agree on the causes and challenges of trade asymmetries, their differences in emphasis, sectoral focus, and interpretation of the significance of certain factors reveal some differing

[17] https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/w/ks-gq-24-020

perspectives. These divergences are not necessarily contradictory but rather reflect the complexity of the issues and the varying contexts in which trade asymmetries are analyzed. They underscore the need for tailored approaches to addressing asymmetries, taking into account the specific trade relationships, sectors, and data systems involved.

*Trade in Goods*

15. **Global Production Arrangements.** Incomplete or inconsistent coverage of transactions related to global production arrangements—goods for processing and factoryless goods production—can result in significant asymmetries and may have an impact on the global current account discrepancy. Box 2 discusses the impact on asymmetries arising from uneven and incomplete treatment of FGP by partner economies. Similar issues occur under goods for processing arrangements. Merchanting is another type of global production arrangement that can contribute to asymmetries. In this case, the recording of merchanting prescribed in the international standards can result in asymmetries due to the differences in the way each of the three partners in the trilateral arrangements record the information in the BOP (see Box 3).

16. **Valuation Differences.** For IMTS basis goods, which are generally the source data for BOP-basis goods, exports are typically valued FOB, while imports are valued at CIF. The recommended CIF-to-FOB adjustment is complex and inconsistently applied, leading to mismatches between reported exports and imports. During the update of *BPM6,* it was agreed that changing the recommended valuation to the invoice value was preferred from a conceptual perspective, and it is expected to reduce asymmetries. However, given the limited results from initial testing of this approach, it was agreed to maintain the status quo with this update, with a plan to move to invoice values in the next update of the manual (see *BPM7*, paragraph 10.32).

17. **Treatment of Special Entities.** The activities of non-resident VAT traders and special purpose entities can distort trade statistics if not properly adjusted for in the accounts. These entities often exist for tax, regulatory, or accounting reasons and may conduct transactions that do not correspond to actual movement of goods or services. If their activities are not properly identified and adjusted for, they can artificially inflate or distort trade statistics, leading to asymmetries between countries' reported imports and exports.

18. **Data errors and system limitations.** Human errors in customs declarations, misclassification of goods, and outdated or incomplete data systems further contribute to discrepancies.

19. **Partner country attribution errors.** Goods are sometimes incorrectly assigned to intermediate countries rather than final destinations, especially in complex supply chains involving merchanting, re-exports, or transit trade. For example, goods passing through third countries may be attributed differently by exporters and importers. These differences in partner country attribution cause bilateral asymmetries but would not contribute to global discrepancies, since they would be offsetting.

### Box 2. Impact of FGP on Global Asymmetries

Uneven recording of FGP arrangements can lead to asymmetries in the BOP goods account if compilers in one economy record transactions related to FGP according to the change-of-ownership principle, while the partner uses IMTS data (based on physical movement of goods) without adjustment. In addition, valuation issues may arise if, when using IMTS, the value recorded in the customs data is different from the value that should be used for FGP-related transactions. (See BOPCOM 25/17 for a more detailed discussion and examples.)

*Pilot survey of FGP practices, 2025*

In early 2025, the IMF surveyed 25 countries that are likely locations of FGP arrangements to understand the current statistical treatment of FGP. The survey covered three perspectives: (1) countries hosting MNEs who arrange for the manufacture of products abroad under FGP arrangements (so-called principals, or factoryless goods producers); (2) those hosting contractors; and (3) countries buying the finished goods.

<u>The preliminary results of the pilot survey are based on 19 respondent countries:</u>

Twelve compilers said their economies host MNEs who arrange for the manufacture of products abroad under FGP arrangements. An additional 6 said that their economy "may" have such MNEs, but they do not have data to verify this. Only one respondent said that they were unlikely to host such MNEs.

- Most (11/18) of the respondents that host (or likely host) MNEs who arrange FGP attempt to account for the production that takes place abroad in their BOP statistics.
    - In some countries this is captured as merchanting (i.e., a net recording instead of a gross recording in the goods account);
    - In some cases, this is done through a large case unit or a special approach to collect information from the largest companies.
    - One country links business and trade statistics to identify the relevant transactions.

Five of the respondents said their economy hosts both MNE principals and contractors. An additional 5 said they "may" host contractors.

- None of the respondents who host contractors can fully account for the FGP transactions (including correcting for partner country attribution). However, 7 are able to account for finished goods that are sold to final customers in the contractor's own economy.

Finally, respondents were asked about how they address FGP as the final buyer of the finished goods. In this case, the goods would be recorded in the country's customs-basis import data. However, the import would be recorded vis-à-vis the country of the contractor, not the country of the MNE who arranged for its production (as is required for BOP statistics by partner economy). None of the respondents are making adjustments to account for differences in partner country attribution or valuation.

Based on these preliminary results, the implications for asymmetries and current account measurement are:

- Data gaps (e.g., a transaction being recorded by one partner but not the other);
- Differences in partner country attribution;
- Differences in valuation.

Biases that may arise in the measurement of the current account balance (CAB) include:

- MNE host countries may understate the CAB if they omit imports of FGP-produced goods from contractors and subsequent exports to final buyers (which would be valued at a higher price that includes the intellectual property);
- Contractor countries may overstate the CAB if they report exports at the full sale value rather than the amount paid to them by the MNE principal.
- Contractor countries may also overstate the CAB if they do not account for FGP goods sold into their domestic market—by first recording an export to the country of the MNE, at ex-factory price (the cost of goods as they leave the contractor's facility, including the contractor's margin), and then a subsequent import from the MNE, at wholesale price.
- For the country of the final buyer, the CAB could be overstated if the import is recorded at a value closer to the ex-factory price.

Much more work is needed to understand the extent and magnitude of these measurement issues, particularly with regard to the valuation of exports and imports in customs versus BOP statistics.

*Trade in Services*

20. **Measurement Challenges for Imports**. Imports of services are harder to capture than exports, as importers are often more numerous, smaller, and less likely to be surveyed. This leads to underreporting and greater reliance on estimation methods for imports.

21. **Classification and Methodological Differences**. The intangible nature of services makes them more susceptible to classification errors and partner country attribution issues. Sectors such as financial services, intellectual property, and digital trade are particularly affected due to complex transactions and multinational enterprise structures.

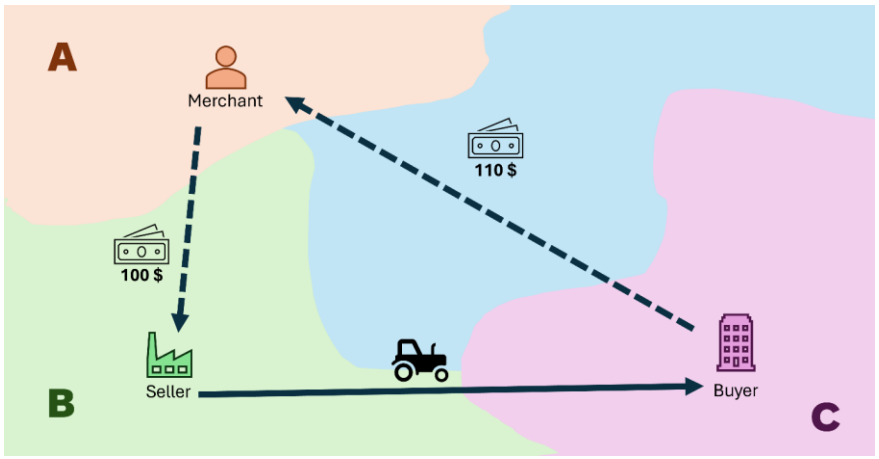
22. **Data Source and Survey Design Issues**. Differences in survey coverage, thresholds, and the use of administrative versus survey data can result in inconsistent reporting. For example, threshold-based sampling may exclude many small importers, and differences in survey questions can lead to differing interpretations.

23. **Definitional and Modeling Differences**. Countries may use different models or definitions for estimating certain services (e.g., FISIM, insurance), leading to bilateral asymmetries. The adoption of new international standards at different rates also contributes to discrepancies.

24. **Counterparty Identification and Digitalization**. The rise of digital trade, digital financial services and the use of digital intermediation platforms complicate the identification of counterparties and the correct attribution of transactions, especially when services are provided remotely or through global platforms.

### Box 3. Asymmetries in Recording of Goods Under Merchanting

The recording standards of *BPM6* create bilateral asymmetries for transactions related to goods under merchanting for the countries that are involved in this trilateral relationship. According to *BPM6* §10.44a "The acquisition of goods by merchants is shown under goods as a negative export of the economy of the merchant". The following simple example demonstrates the issue.




A merchant resident in country A buys goods in country B for $100 and sells the goods to country C for $110. For BOP purposes, country B would need to adjust its IMTS that records exports of goods based on their physical movements to record exports of $100 vis-à-vis country A (scenario 1); in the case where country B does not manage to adjust IMTS accordingly, exports of $100 would be recorded vis a vis country C (scenario 2). For both scenarios, bilateral asymmetries between country A and B would be created.

*Scenario 1*: If country B records in BOP exports vis-à-vis country A, then the bilateral balance on the goods account between A and B would not be affected, but asymmetries would occur for exports and imports of goods. Country A would underreport in BOP its total exports vis-à-vis country B by the negative entry of $100 on the export side and also underreport in BOP its imports by $100 vis-à-vis country B because in BOP the exports of B vis-à-vis A are not mirrored on the import side of country A. If country C also adjusts its IMTS to record in BOP imports vis-à-vis country A and not B, then no further bilateral asymmetries between B and C would occur. In the case where country C records in BOP imports vis-à-vis B based on the physical movements of the goods in IMTS, then bilateral asymmetries in BOP between A and C would be the result.

| BoP-Positon | vis-a-vis | Country A | | Country B | | Country C | |
|---|---|---|---|---|---|---|---|
| | | Credits | Debits | Credits | Debits | Credits | Debits |
| General Merchandise | Country A | | | | | | |
| | Country B | | | 100 | | | 110 |
| | Country C | | | | | | |
| Goods sold under merchanting | Country A | | | | | | |
| | Country B | | | | | | |
| | Country C | 110 | | | | | |
| Goods aquired under merchanting | Country A | | | | | | |
| | Country B | -100 | | | | | |
| | Country C | | | | | | |
| Net Exports of goods under Merchanting | Country A | | | | | | |
| | Country B | | | | | | |
| | Country C | 10 | | | | | |

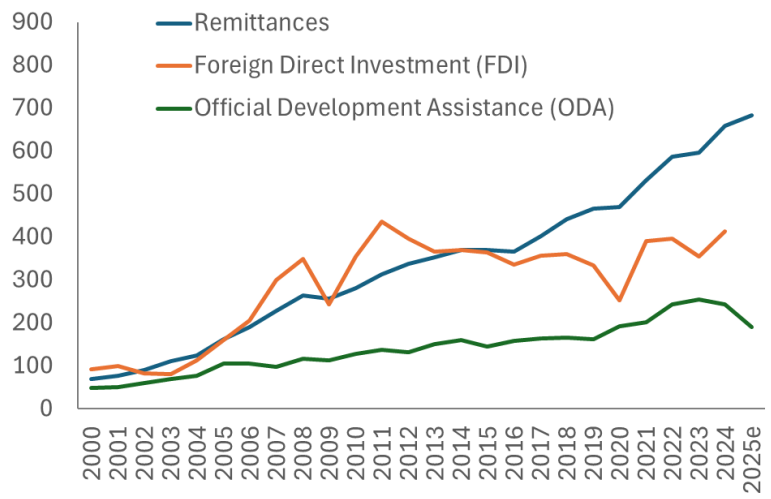
*Scenario 2*: If country B records in BOP exports vis-à-vis country C, then data asymmetries would occur between A and B because country B would in BOP not record anything vis-à-vis country A, while country A would continue to record negative $100 in exports. If country C does not adjust its IMTS data and records in BOP imports vis-à-vis B, then bilateral asymmetries between A and C. In the case where country C records in BOP its imports correctly vis-à-vis country A from which the goods are purchased, then bilateral asymmetries between B and C would be created due to the fact the exports recorded in BOP by B to C would not be mirrored by country C.

| BoP-Positon | vis-a-vis | Country A | | Country B | | Country C | |
|---|---|---|---|---|---|---|---|
| | | Credits | Debits | Credits | Debits | Credits | Debits |
| General Merchandise | Country A | | | | | | |
| | Country B | | | | | | 110 |
| | Country C | | | 100 | | | |
| Goods sold under merchanting | Country A | | | | | | |
| | Country B | | | | | | |
| | Country C | 110 | | | | | |
| Goods aquired under merchanting | Country A | | | | | | |
| | Country B | -100 | | | | | |
| | Country C | | | | | | |
| Net Exports of goods under Merchanting | Country A | | | | | | |
| | Country B | | | | | | |
| | Country C | 10 | | | | | |

In addition to the problematic country allocation for goods under merchanting which creates bilateral asymmetries, another inconsistency concerning the valuation of the traded goods under merchanting may further contribute as well. *BPM6* states (§10.30) that goods recorded under general merchandise should be valued on an FOB basis. However, according to *BPM6* §10.44d, for transactions related to goods under merchanting, the economy where the merchant is resident has to record the purchases and the sales of the goods based on transactions prices that may deviate from a FOB valuation. In contrast, the country that sells the goods to the merchant and the economy that buys the goods from the merchant have to record these transactions (see *BPM6* §10.45) under general merchandise and have to apply a FOB valuation for their corresponding exports and imports of goods.

## PERSONAL TRANSFERS (REMITTANCES)[18]

**Figure 7. Remittances to Low- and Middle-Income Countries (excluding China) are Larger than FDI and ODA Combined, Billions of U.S. Dollars**

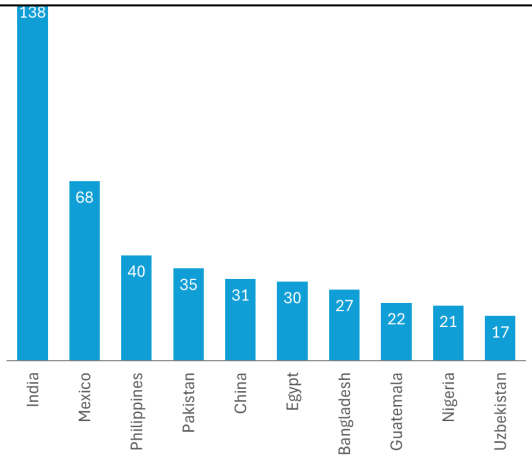



Source: IMF, World Bank staff calculations.

*25.* Remittances have become a financial lifeline to low- and middle-income countries (LMICs). In 2024, remittances to LMICs reached $684 billion, surpassing the sum of foreign direct investment (FDI) and official development assistance (ODA) (Figure 7).[19] Top recipient countries included India, Mexico, the Philippines, Pakistan and China (Figure 8, first panel). In many countries remittances are the main source of foreign exchange, exceeding exports and FDI. And in smaller countries, they frequently amount to more than 10 percent of GDP (Figure 8, second panel). This highlights both the macroeconomic

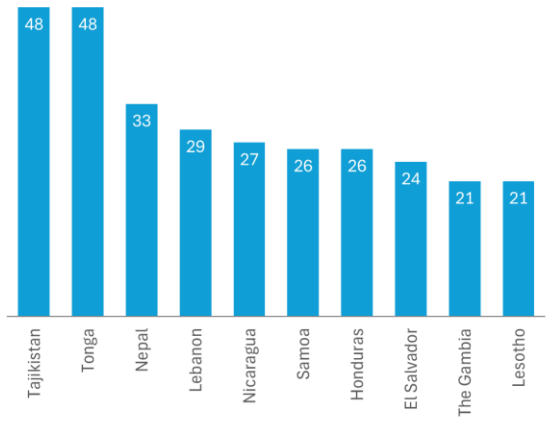
**Figure 8. Top Developing Country Recipients of Remittances, 2024**

Billions of U.S. Dollars




Source: IMF, respective country central banks, World Bank staff calculations.

Percent of GDP

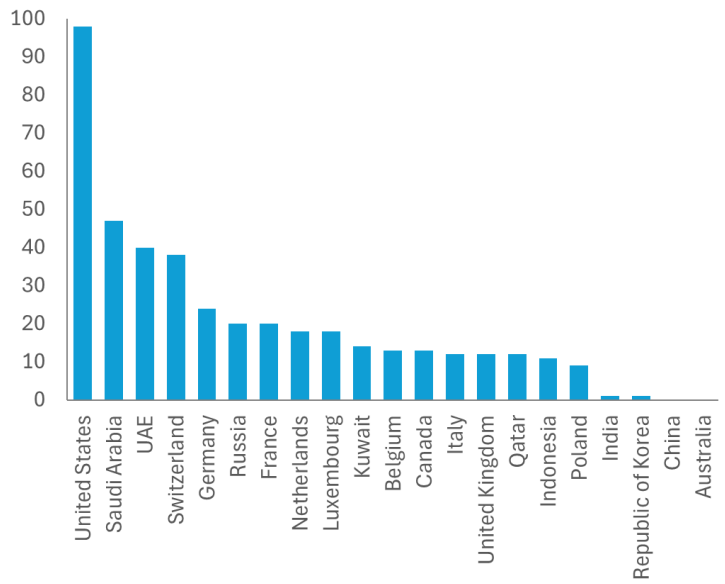



Source: IMF, World Bank, respective country central banks, World Bank staff calculations.

[18] This section was prepared by WS2, comprising the following members: Messrs. Dilip Ratha (lead), Esmond McLean, and Joerg Feuerhake, and Ms. Iman AbouHassan.

[19] In this calculation, remittances are defined as the sum of personal transfers and compensation of employees following the *BPM6* definitions for these two variables.

**Figure 9. Top Source Countries for Remittances, Billions of U.S. Dollars, 2024**




Source: IMF.

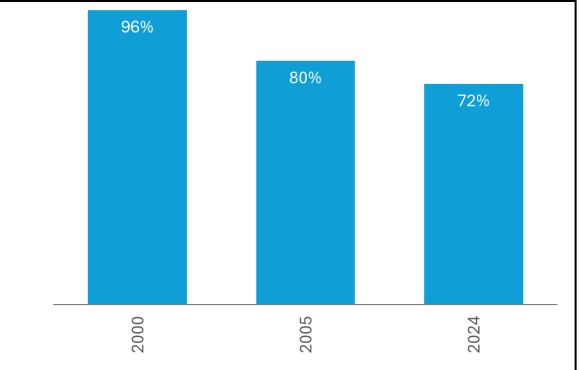
importance of remittances and their role as household-level social protection, making reliable measurement essential.

26. The United States is the largest source country of remittances, followed by Saudi Arabia, United Arab Emirates (UAE), Switzerland, and Germany (Figure 9). Data on bilateral flows are not readily available, but estimates in the literature (notably those from the World Bank's Global Knowledge Partnership on Migration and Development, or KNOMAD, which is based on Ratha and Shaw 2007) indicate that the largest remittance corridors are US-Mexico and UAE-India. Gulf Cooperation Council (GCC) countries in general are a large source of remittance flows to South Asia, the Middle East and South-East Asia, whereas Russia is the top source for flows to Central Asia. Western Europe is a major source for Eastern European countries and North Africa. South-South remittances, for example, from India to Bangladesh, from South Africa to Southern African Development Community (SADC) countries, are also large, but they are believed to be under-recorded.

27. Worldwide flows of remittances (including those to LMICs cited above as well as flows to developed countries) surpassed $800 billion as of 2024 (see Figure 10, right panel). This sum reflects inward flows reported officially by all the countries. Unfortunately, however, this sum is significantly larger

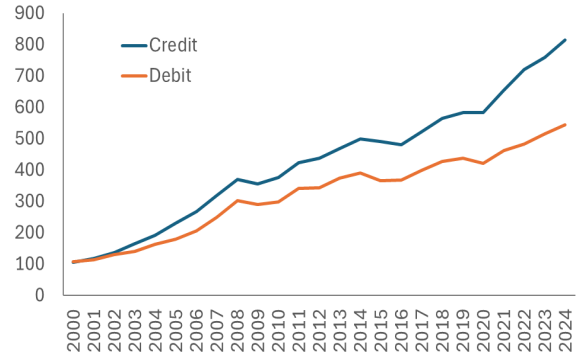
**Figure 10. Global Asymmetry in Data on Remittances**

Outward Remittances Flows as a Share of Inward Remittances Flows, Percent




Source: IMF, respective country central banks, World Bank calculations.

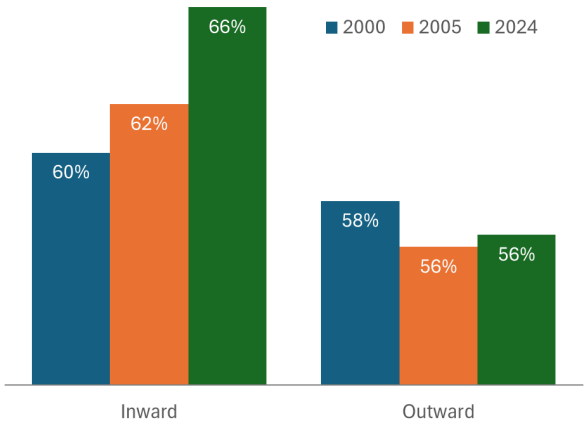
Personal Transfers and Compensation of Employees, Billions of U.S. Dollars




Source: IMF.

**Figure 11. Split between Personal Transfers and Compensation of Employees has Remained Stable during 2000–2024**

As a Share of Total Flows, Percent




Source: IMF, respective country central banks, World Bank calculations.

than the sum of outward flows reported by countries, indicating a large asymmetry in data reporting globally. This widening gap raises concerns about comparability of source and recipient country statistics and calls for systematic reconciliation. In 2024, the sum of outward flows was only 72 percent of the sum of inward flows reported by countries (Figure 10, left panel). Ideally, this ratio should be close to 100 percent. Indeed, it was so in 2000. Thus, global asymmetries in remittances data have steadily increased (that is, the ratio of outward to inward flows has steadily decreased).

28. At the same time, the composition of total personal remittances in terms of its two components—personal transfers and compensation of employees—has remained remarkably stable. During 2000 to 2024, globally, the share of personal transfers in total *inward* remittances ranged from 60 percent to 66 percent, and the same share in *outward* remittances was even more stable, between 56 to 58 percent (Figure 11). This share has remained stable at 77 to 78 percent for inflows (credit) to net recipient countries, and at 52 to 58 percent for outward flows (debit) from net sending countries. While these shares have been stable, the underlying asymmetries remain, suggesting that misclassification or underreporting is more structural than cyclical.

**Major Sources of Asymmetries**

29. The remittances workstream mainly relied on the assessments of the RemitStat working group.[20] The RemitStat working group identified the following factors contributing to discrepancies in remittances data between sending and receiving countries.

30. **Use of different compilation models.** As described, compilers mainly rely on two data sources—migrant population statistics and remittance transaction data. If compilers in one economy use a demographic approach while the partner economy employs a transaction-based approach, asymmetries will likely arise. It should be noted that, in theory, the compilation models should produce comparable data (otherwise one of the models will be recognized as not recommended). However, in practice, each approach can miss several specific pieces of information. For example, transaction-based models may not account for remittances sent in-kind or via informal channels. Migration-based models are slowly adapting to behavioral changes and may miss structural changes in migration and earning.

[20] The RemitStat working group was launched by the World Bank's KNOMAD initiative to improve data on cross-border remittances. As of June 2024, when the multi-donor trust fund supporting KNOMAD closed, 46 countries had joined the RemitStat along with the IMF, Eurostat, and the World Bank. Since then, Nigeria and Tuvalu have approached the World Bank to join RemitStat.

31. **Data Availability.** Statistical compilers in host economies usually have more information about migrants and their income level. Statistical compilers in migrants' home countries, however, may not have access to data of the same granularity. On the other hand, they can utilize data from household surveys, while such data usually are not accessible to compilers in host economy. In the absence of surveys, compilers must rely on other reliable sources to capture migrant profiles.

32. **Informal and Non-Traditional Channels.** Informal channels can be covered to a different extent in different economies. Such situation brings additional gaps to data. This also relates to the remittances in kind and funds hand-carried by friends or couriers. While migration models assume that the transfers are covered irrespective of which channel is being used, transaction-based models need to be adjusted to capture and classify correctly unregulated flows. Another example is use of card-to-card transfers, when the main challenge for compilers would be to separate remittance related transactions from all other P2P transactions. Developing frameworks to estimate such flows is essential to narrowing global and bilateral asymmetries.

33. **Residency of Migrants/Seasonal Workers.** The residency criterion is universal across all macroeconomic domains in international statistical accounting based on *BPM6*. However, compilers may still classify residency differently. For example, what one economy classifies as seasonal workers (for which the full amount of compensation would have to be recorded in BOP instead of just personal transfers which is only a small fraction of the received compensation), another might classify as migrants. This discrepancy poses challenges in accurately recording transactions for highly mobile individuals, a phenomenon that has intensified with the global rise of remote working arrangements. Whereas seasonal workers were traditionally associated with low-skilled or low-paid roles, many professionals, especially in the IT sector, now engage in remote work from abroad. The statistical treatment of refugees further complicates the data, introducing additional variability in how residency is classified and recorded.

34. **Fast Changing Environment.** Compilers may not follow the development of financial infrastructure or migrants' behavior. In such cases, cash inflows can be quite volatile, and compilers may not be able to adjust the model. COVID-19 pandemic is an example of how compilers could not understand the fundamental changes in the remittance senders' behavior. New transfer channels, or changes in spending/remitting behavior can often only be captured with a time lag. Digitalization and the use of alternative payment systems, like mobile money or card to card transfers, raise challenges not only to capture but also to classify captured transactions correctly. The use of stablecoins in providing cross-border remittance services has grown rapidly in the past two years, especially during the first half of the current year.[21] The rapid adoption of stablecoins and its growth poses new challenges in tracking sources and destinations of flows.

35. **Time Lags.** Time lags (i.e., when transaction in one economy is recorded in one period and in a different period in counterpart's economy) may have an impact on data asymmetries, especially in higher-frequency (monthly and quarterly) data, although less so in annual data. The asymmetries due to time differences in reporting are likely to be significant in times of natural or economic shocks and abrupt

[21] See Chad Harper (September 2025). The rise of stablecoin remittances: Insights from Coinbase data. Coinbase Institute. September 2025; Raphael Auer (May 2025). Defying gravity? An empirical analysis of cross-border Bitcoin, Ether and stablecoin flows. BIS Working Paper 1265; and Lisa C. Nestor (September 2025). Stablecoin Performance in Cross-Border Payments: Evidence from a Digital Dollar Wallet. Stanford, Future of Digital Currency Initiative.

changes to technology. Improving the timeliness and synchronization of reporting can help mitigate these discrepancies.

36. **Misclassification of Related Flows.** Migrants often send money to their home countries in order to make investments in real estate or save money as bank deposits. Such transfers are incorrectly classified as remittances by some recipient countries. Similarly, use of credit cards by visiting relatives may get classified as tourism receipts even if the purpose was cash transfer to family members. In the case of tax breaks offered on remittances, inward flows of investments or export earnings could be classified as remittances. Similarly, relaxed FX controls on inward foreign investments can lead to remittances being brought in as FDI.

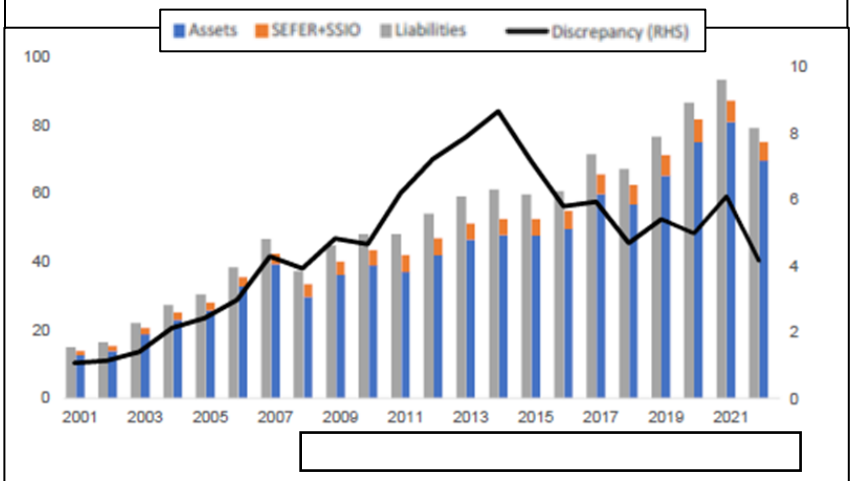
37. **Incorrect Classification of the Counterpart Country.** Transaction-based models may inaccurately indicate the sender country, often showing the country of settlement instead. While most money transfer operators (MTOs) can provide detailed information on transactions within their owns systems, alternative channels may lack reliable documentation, leading to potential biases in the data. This issue can be even more problematic in banking transfers, as banks usually use a few settlement accounts for sending and receiving money to any country.

38. **The use of third countries and offshore financial centers.** The use of third countries and offshore financial centers for cross-border remittances seems to have increased in recent years, especially after the imposition of U.S. sanctions against Russia following the latter's invasion of Ukraine. There are anecdotal reports of funds to Russia being channeled through third countries or offshore financial centers. Likewise, residents of many remittance-receiving countries that are classified by Financial Action Task Force (FATF) as vulnerable to risks of money laundering and financing of terrorism often receive funds either from informal channels and/or from third countries. This could also be resulting in some data gaps.

## SECURITIES[22]

39. As Milesi-Ferretti (2023) notes, the most important component of the global discrepancy in estimates of external creditor and debtor positions relates to portfolio securities. Global asymmetries in securities, as recorded in portfolio investment and reserve assets, have been increasing over the past two decades. Globally, external assets are consistently smaller than external liabilities (see Figure 12) suggesting systematic under-coverage of assets.[23] Notably, the global discrepancy has significantly declined from its peak of $8.7 trillion in 2014, which may be attributed to better coverage in the collection of securities, in particular for those held as reserve assets, but may also reflect more stringent efforts to combat tax evasion (Benetrix et al., 2021).

**Figure 12. Global Asymmetry between Assets and Liabilities in International Securities Holdings, Trillions of U.S. Dollars**




Source: Lane and Milesi-Ferretti (2018), IMF Securities Held as Foreign Exchange Reserves (SEFER) and Securities Held by International Organizations (SSIO).

40. Recent studies (Milesi-Ferretti, 2023; Diz Dias et al., 2024) attribute this rise in asymmetries to underreporting, data collection gaps, and the complexity of cross-border custodial arrangements. Financial centers, third-party holdings (TPH), tax havens, sovereign wealth funds (SWFs), and special purpose entities (SPEs) are highlighted as key contributors to these discrepancies, particularly in obscuring ultimate beneficial ownership. In the literature, it is widely assumed that official statistics capture to a considerable extent portfolio investment liabilities (issuances), portfolio investment assets held by direct reporters (legal entities with reporting obligations), and portfolio investment assets held by households in countries other than offshore financial centers. Under this assumption, the global discrepancy between portfolio liabilities and assets (including securities held as foreign exchange reserves and held by international organizations) corresponds broadly to the financial assets of households held via offshore financial centers.

41. The global discrepancy in international security holdings reached approximately $6.1 trillion in 2021, equivalent to 5.5 percent of global GDP. These missing assets are concentrated in a small group of countries underscoring the disproportionate role of major financial hubs in shaping global asymmetries. According to recent studies and following a methodology linking deposits with securities (see Diz Dias et al (2024)), 12 countries accounted for about 70 percent of global discrepancies in 2021 as recorded in the IMF Coordinated Portfolio Investment Survey (CPIS). These countries include the United States,

[22] This section was prepared by WS3, comprising the following members: Mssrs. Jorge Diz Dias (lead), Andrew McCallum, Wesley Harris, and Musa Sibanda.

[23] Using the External Wealth of Nations (EWN) dataset by Lane and Milesi-Ferretti (2018) as well as IMF data.

United Kingdom, Germany, Netherlands, Cayman Islands, Ireland, Luxembourg, Switzerland, France, Belgium, Italy, and Singapore.

42. Data gaps in bilateral data complicate efforts to understand the global asymmetries. The IMF's Portfolio Investment Positions by Country dataset (collected on the Coordinated CPIS) has only around 85 countries reporting assets, and only 23 reporting liabilities, which are "encouraged" data on the CPIS reporting form.

43. While data gaps and underreporting (e.g., sovereign wealth funds holdings) play a role in asymmetries, intermediary structures such as custodial arrangements and SPEs that obscure economic ownership are key drivers of these discrepancies.

*Equity and debt*

44. Equity securities are the primary driver of global portfolio investment asymmetries due to their significant contribution to the asset-liability gap, their valuation, and the challenges associated with cross-border ownership reporting.

45. Studies (e.g., Milesi-Ferretti, 2023; Diz Dias et al., 2024; Beck et al., 2024) estimate that global portfolio equity liabilities exceed reported equity assets by approximately $4 trillion as of 2021, representing the largest share of global discrepancies in international financial statistics. Investment fund shares issued in global financial centers account for most of the global equity discrepancy (Milesi-Ferretti, 2024; Diz Dias et al., 2024), reinforcing the importance of improving data collection frameworks for investment funds. In contrast, debt securities, while also contributing to discrepancies, exhibit valuation mismatches and reporting gaps that are smaller and more geographically dispersed.

**Major Sources of Asymmetries**

46. **Data Gaps.** One part of the global asymmetry in portfolio investment relates to non-participating countries and incomplete coverage of resident sectors (see Milesi-Ferretti, 2023) in the IMF CPIS and IIP. Countries with relevant securities holdings such as the United Arab Emirates, Taiwan, Qatar, and the British Virgin Islands do not participate in the IMF's CPIS nor report IIP data to the IMF, leaving significant gaps in cross-border securities reporting that cause global asymmetries. Similarly, resident sectors like households and non-financial corporations may not be fully covered by participating countries due to challenges in data collection and reporting frameworks (see Milesi-Ferretti, 2023). This incomplete coverage of resident holdings of foreign securities impacts the comparability and cause global asymmetries.

47. **Complex Custody and Ownership Chains.** A large share of global equity discrepancies arises from complex custody and ownership chains. Such chains create opacity in ownership and reporting, making it difficult to trace the economic owner (see Table 1). These issues are particularly pronounced in financial hubs such as the United Kingdom and Switzerland. For instance, over 60 percent of non-resident-held shares in Swiss custody accounts are issued by Swiss entities, but the ultimate ownership often remains unclear (Beck et al., 2024). Omnibus accounts, where assets are pooled by financial intermediaries, further obscure the distinction between legal and economic ownership, limiting compilers' ability to reconcile discrepancies. These practices fragment reporting channels and conflict with the residency-based statistical approach, leading to misalignment and asymmetries.

**Table 1. Types of Ownership**

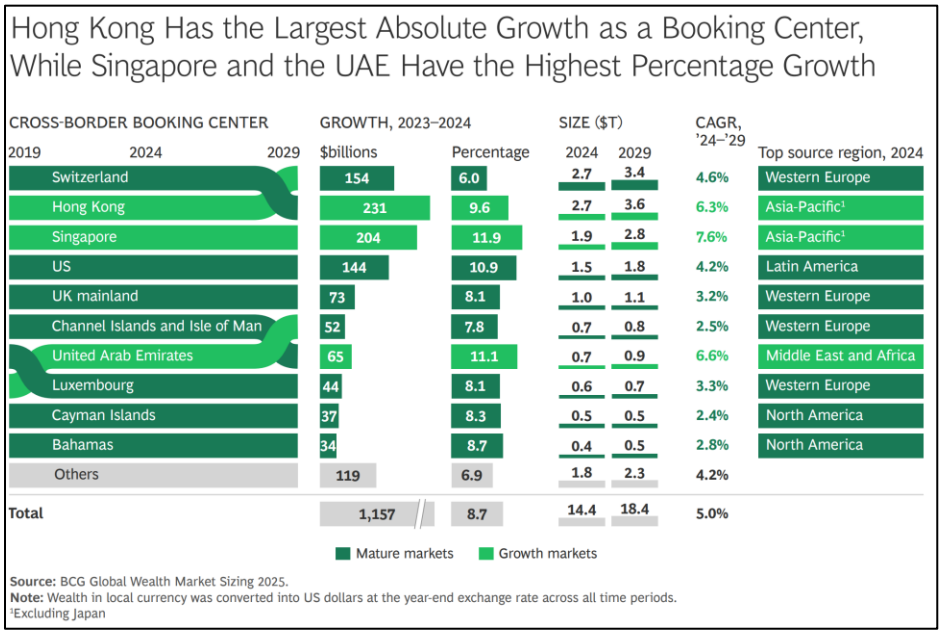
| Type of Owner | Definition | Example | Implication for immediate residency basis statistics |
|---|---|---|---|
| **Economic Owner** | Party that bears the risks/rewards of the security. | A household in Country A investing via a custodian in Country C. | Position/transaction in securities holdings booked on household accounts. |
| **Ultimate beneficiary owner** | Entity that ultimately benefits from the security. | A multinational corporation owning securities via an affiliate in Luxembourg. | Position/transaction in securities holdings booked on the affiliate accounts. |
| **Legal owner** | Entity formally recorded as the owner of the security. | A custodian or central counterparty (CCP) legally holding securities on behalf of non-resident household investor. | Position/transaction in securities holdings booked on household accounts. |

48. Equity asymmetries seem to be concentrated in specific financial hubs, such as Ireland, Luxembourg, Belgium, Singapore, and the United Kingdom, where cross-border holding of investment fund shares dominate (also see Figure 13 for recent growth in cross-border booking centers):

a. Ireland and Luxembourg: These jurisdictions host a large number of investment funds marketed globally, but the economic ownership of these shares is often underreported by statistical authorities due the complexity of global asset management and their intermediaries/auxiliaries structures.

b. United Kingdom: A significant portion of equity discrepancies is tied to investment fund shares managed in the UK but held by international investors whose residency is difficult to establish (Milesi-Ferretti, 2023).

**Figure 13. Illustration of Growth in Cross-Border Booking Centers**
**(Excerpt from Boston Consulting Group Global Wealth Market Sizing, 2025)**




49. **Third-Party Holdings (TPH).** Similarly, TPH, foreign securities that are held in custody in a foreign custodian on behalf of resident investors, can significantly contribute to asymmetries (see illustration in Box 4). Data collection methods for TPH vary, with some relying on direct reporting by the economic owner of the assets and others on indirect reporting by intermediaries (e.g., custodians, securities dealers, brokers, or central counterparties). While direct reporting may face challenges in accurately identifying economic ownership, indirect reporting introduces a higher risk of misreporting or underreporting. This occurs because statistical authorities can typically only request data from domestic intermediaries. Assets held via foreign intermediaries may go unreported unless the authorities directly contact the economic owner, a process especially difficult for households and non-financial corporations. Indirect reporting by resident custodians is often incomplete leaving entire categories of household and non-financial corporate holdings potentially unrecorded. Foreign custodians managing securities for non-resident investors frequently fail to provide comprehensive data. This underreporting is a key contributor to global asymmetries.

50. The IMF's Working Group on Third-Party Holdings (WG TPH), established in 2001, documented that household TPH can be sizable and hard to capture, and recommended leveraging custodians in the jurisdiction where assets are held to collect and exchange aggregated data on non-resident individuals' security holdings, mirroring the approach used in the IMF's CPIS. As described by Sánchez-Muñoz and Israël (2007), evidence gathered by euro area countries (France, Germany, Italy, Netherlands) and by the U.S. Federal Reserve (from major private banks) confirmed non-resident household positions are material, while Swiss National Bank figures for non-resident non-institutional assets in custody underscored the scale of the gap. The ECB Task Force on Portfolio Investment Collection Systems (TF-PICS) concluded that an all-encompassing third-party scheme would be prone to double-counting along long custody chains, but that an annual exchange focused on household holdings was feasible and should extend beyond the European Union to key custody jurisdictions. Operational proposals included automated, security-by-security reporting from custodians with post-processing by statistical compilers,

confidentiality safeguards via aggregation (by holder and issuer country, without disclosing the custody location), and centralized coordination by the IMF (and, for the euro area, the European Central Bank via the Centralised Securities Database). Legal reviews noted that some countries would need enabling legislation to collect and share third-party data.

51. **Offshore Wealth and Tax Havens**. Zucman (2013) estimates that a large share of unreported global equity assets is tied to household wealth in offshore tax havens. For example, financial centers such as the Cayman Islands, Switzerland, and Singapore host a considerable proportion of unrecorded household equity holdings.

52. **Special Purpose Entities (SPEs)**. SPEs are frequently used to pool and manage cross-border investments, particularly in jurisdictions like Luxembourg and Ireland. They can complicate the distinction between legal ownership and economic ownership, leading to asymmetries in external statistics.

53. Recording investments in securities by resident units via foreign SPEs (such as trusts, family trusts, legal entities with passive management, etc.) raises challenges between functional categories of the balance of payments. The convention of treating SPEs as separate units when they are in a different country from their controlling parent implies a foreign direct investment (FDI) relationship between the parent and the SPE. As a result, the securities held by the SPE cannot be “looked-through” by the parent unit. Instead, the parent unit records an equity position with the SPE in FDI, while the SPE becomes the economic owner of the securities, altering the geography of those holdings. Asymmetries can arise if any of the statistical authorities involved (e.g., country of the parent unit, SPE country, country where the securities are issued) fail to recognize the SPE as the economic owner. Any look-through will immediately create a reporting asymmetry (see Box 5).

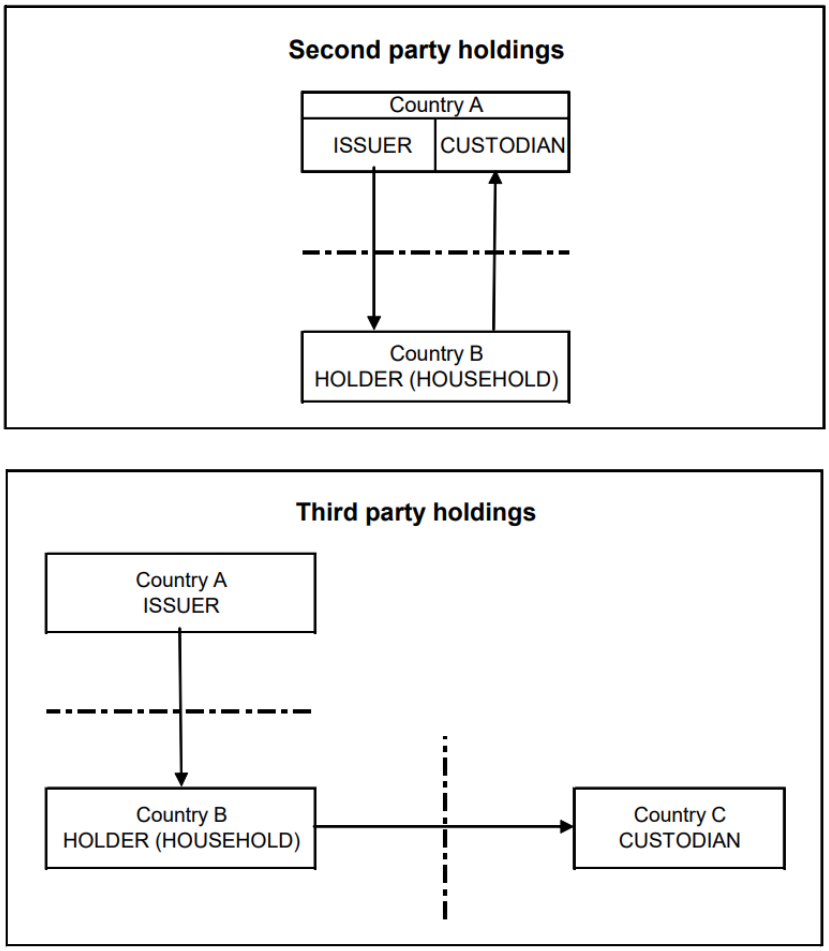
### Box 4. Third-party holdings

*Excerpt from Sánchez-Muñoz, C., and Israël, J.-M. (2007). The difficulties attached to the collection of information on households' holdings of securities: third-party reporting. IFC Bulletin, 25, 199–204. Basel: Bank for International Settlements. URL: https://www.bis.org/ifc/publ/ifcb25.htm*

When households entrust securities to a non-resident custodian, two different situations may appear (see chart 1): (i) the so-called "second-party holdings" occur when the securities are deposited with a custodian located in the same country as the securities' issuer; (ii) conversely, on "third-party holdings" investors select a custodian located in a country other than that from which securities originate.[3]

Chart 1

**Modalities of securities holdings deposited abroad**




The workstream on securities grouped second- and third-party holdings and referred to them generically as third-party holdings.

**Box 5. Asymmetries due to SPEs**

Asymmetries can arise if any of the statistical authorities involved (e.g., country of the parent unit, SPE country, country where the securities are issued) fail to recognise the SPE as the economic owner. Consider the following example.

Suppose a household in country X sets up a SPE (trust) financed with a $10 loan in country W to buy $5 securities of country Y and $5 securities of country X.

| | Assets | Liabilities |
|---|---|---|
| Country X | FDI $10 loans in W<br>FDI $0 equity in W<br>Deposits1 $-5 | PI $5 securities held by W |
| Country W | PI $5 securities issued by Y<br>PI $5 securities issued by X | FDI $10 loans of X<br>FDI $0 equity of X |
| Country Y | Deposits $5 | PI $5 securities held by W |
| Total<br>FDI $0<br>PI $0 | $20<br>FDI $10<br>PI $10 | $20<br>FDI $10<br>PI $10 |

*PI= portfolio investment; FDI= foreign direct investment.*
*1. We use "Deposits" as a simplified visualization of the net counterbalancing entry to the other transactions.*

In the event that the statistical authority in W fails to record the SPE, the global asymmetries would be PI $-10 (excess of liabilities) and FDI $10 (excess of assets) with securities assets of the SPE and related FDI liabilities on country W not covered.

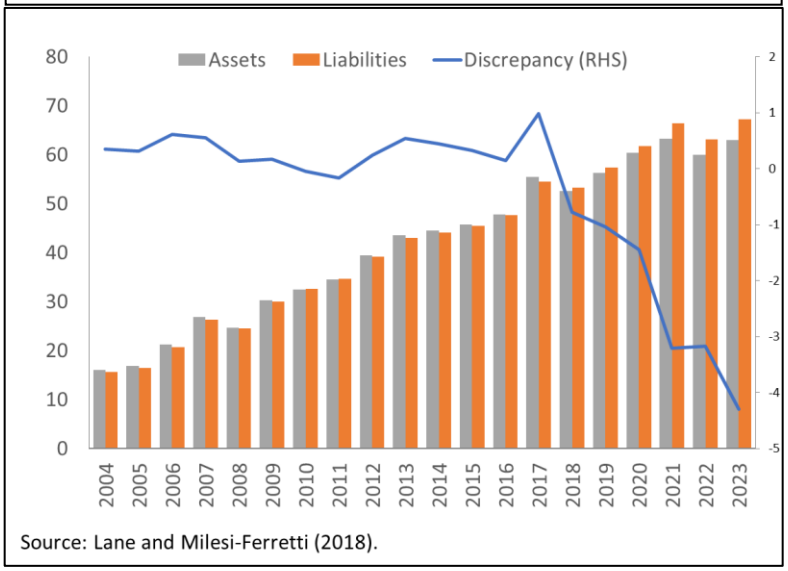
| | Assets | Liabilities |
|---|---|---|
| Country X | FDI $10 loans in W<br>FDI $0 equity in W<br>Deposits $-5 | PI $5 securities held by W |
| Country W | | |
| Country Y | Deposits $5 | PI $5 securities held by W |
| Total<br>FDI $10<br>PI $-10 | $10<br>FDI $10<br>PI $0 | $10<br>FDI $0<br>PI $10 |

54. **Sovereign Wealth Funds (SWFs)**. SWFs collectively manage over $11 trillion in global assets as of 2022, with about 60 percent of their asset allocation into securities. Yet their contributions to

portfolio investment in the IMF CPIS remain underreported. The lack of comprehensive reporting standards and transparency levels vary widely for SWFs. While some SWFs (e.g., Norway's Government Pension Fund Global) disclose holdings, others, particularly in the Middle East and Asia, provide limited or no information. SWFs frequently manage investments through custodial accounts in financial hubs (e.g., Ireland, Luxembourg, Singapore) and often use SPEs to manage investments thus further complicating geographical attribution and masking ultimate beneficial ownership. As described above, these practices further complicate the correct geographical attribution of the economic ownership in statistical reporting.

## FOREIGN DIRECT INVESTMENT STATISTICS[24]

**Figure 14. FDI Global Discrepancy, Trillions of U.S. Dollars**




Source: Lane and Milesi-Ferretti (2018).

55. Historically, asymmetries in global FDI positions had been positive and fairly small. However, in recent years a negative global discrepancy in foreign direct investment has emerged, reflecting estimated liabilities exceeding assets (see Figure 14).[25]

56. To understand the global asymmetries, it is useful to look at bilateral asymmetries. However, this is where one confronts data limitations because of lower coverage in the counterpart economy information. While IMF's IIP dataset has relatively good global coverage of FDI positions (around 160 countries),[26] the IMF's Direct Investment Positions by Country dataset (or DIP, collected on the CDIS) has only around 90 countries reporting outward investment positions and 120 countries reporting inward investment positions. As a result, the DIP covers only around 60 percent of global FDI assets and 75 percent of FDI liabilities.[27]

[24] This section was prepared by WS4, comprising the following members: Mssrs. Fernando Lemos (lead), Andrew Jowett, Mounir Rhandi, and Jorge Diz Dias.

[25] Note the External Wealth of Nations dataset by Milesi-Ferretti and Lane show the discrepancy becoming negative in 2018, while the IIP dataset shows the discrepancy becoming negative in 2011. The EWN database uses IIP data as the main input, but also estimates missing countries, resulting in different levels of FDI assets and liabilities.

[26] As of 2024, there are 171 countries included in the IMF's IIP dataset, some do not report detail for FDI assets and liabilities. Additionally, data are not available for all years for all reporters.

[27] Note this comparison is imprecise due to the difference between directional principle and asset/liability basis, as well as differences in valuation across the two datasets.

57. The IIP and DIP are based on the same underlying concepts and methods, but the DIP is based on directional principle, while IIP is on an asset-liability basis. This makes it challenging to evaluate asymmetries in the gross levels, but it is still possible to look at the asymmetries on a net basis. Furthermore, although the methodological basis is the same, in practice some countries use different valuation or estimation methods to produce the statistics that are reported to the IMF for each, and there are often differences in timing and revision cycles for the two datasets.[28]

58. In both the IIP and DIP datasets, equity is the primary driver of asymmetries, but this is not surprising, as they make up a much larger share of FDI positions.

**Major Sources of Asymmetries**

59. The major sources of asymmetries in FDI statistics are already well documented in previous studies (see Accoto et al, 2025; Milesi-Ferretti, 2023; Damgaard, Elkjaer, and Johannesen, 2024; Damgaard and Elkjaer, 2017; Angulo and Hierro, 2017). As Angulo and Hierro (2017) explain, "the root for asymmetries is often at national level due to inadequate or partial data sources, lack of information, and noncompliance with recommended guidelines" but in some cases "asymmetries may arise even when economies follow current methodological standards" (p. 15). Other asymmetries relate to methodological issues, such as the existence of SPEs and complex ownership structures, or to differences in data sources and estimation techniques. The task team's review found the following major sources of asymmetries, which were consistent with previous studies.

60. **Valuation Differences.** As direct investment asymmetries are concentrated in equity investment, the use of different valuation methods, mainly for unlisted equity, can produce large asymmetries. International standards recommend the use of market value for all financial positions. When actual market prices are not available (such as for unlisted and other equity where there may be no observable market price), *BPM7* indicates that equity positions should be valued according to one of three methods—Own Funds at Book Value (OFBV), recent transaction price, and market capitalization or price-to-book value.[29] However, not all countries follow the international valuation guidelines. This can have implications for bilateral asymmetries as well as at the global level. The asymmetries can be significant, especially when economies apply other valuation methods, such as historical cost. Furthermore, asymmetries may still be significant even if the same method is used with different source data or statistical techniques. Compilers in direct investment source and destination economies may have different access to information about the same entity. Such differences can also be affected by the application of national accounting standards.

61. Sometimes valuation differences may only impact bilateral information. For example, the United States uses historical cost as the valuation method when reporting CDIS data, while they use market value when reporting IIP. The use of historical cost can lead to vastly different measures of external positions. The discrepancy in U.S. FDI data between the IIP data (at market value) and CDIS data (at historical cost) amounted to more than US$2.4 trillion for outward investment and US$8.5 trillion for inward investment in 2023, which presents challenges for data interpretation, particularly when

[28] For example, some countries, such as the United States report FDI equity according to historical cost on the CDIS, while their IIP is reported at market value. Other countries have differences in compilation methods that result in their CDIS-reported data not matching their IIP data, even when adjusted for the directional to asset/liability principle.

[29] BOPCOM 25/18 will provide implementation guidance related to valuation of unlisted equity positions.

examining positions by partner economy.[30] Even when adopting market value valuation, there can be challenges in properly measuring market value changes. Milesi-Ferretti (2023) finds that the rising estimates of U.S. FDI liabilities at market value—which are driven by booming U.S. share prices—do not appear fully matched by partner-country FDI claims. This suggests that either U.S. liabilities at market value are overestimated or partner countries' assets at market value are underestimated.

62. **SPEs and Financial Centers.** Similar to portfolio investment (¶19–20), the use of SPEs and offshore financial centers in FDI ownership chains adds complexity and can lead to differences in geographical allocation of FDI data.

63. **Other Coverage Differences.** Some countries may also have gaps in coverage of the non-financial private sector, either because they lack the legal mandate to collect information from these entities or because they have low participation in their direct investment surveys. The level of coverage of non-resident investment in real estate also often varies across countries, with some countries lacking data sources for real estate investment.

64. **Unallocated or Confidential Data**. Particularly for FDI, where detailed information collected on enterprise surveys are typically required to be kept confidential, economies are sometimes unable to report some counterpart country information.[31] As Angulo and Hierro (2017) note, this does not affect the global discrepancy but does limit the ability to conduct accurate bilateral comparisons. In a limited number of economies where the reporting of unallocated or confidential data on the CDIS is large, this can hamper bilateral comparisons with their counterpart economies.

65. **Debt Between Affiliated Financial Corporations.** As Angulo and Hierro (2017) note, intercompany debt between selected affiliated financial corporations should be excluded from direct investment and included instead in other investment. For some countries, it may not be possible to identify these debt positions and exclude them from FDI, which could lead to asymmetries at the component level (although these would offset when looking at total IIP assets/liabilities).

66. **Criteria for Identifying Entities in a Direct Investment Relationship.** Differences in how economies identify FDI relationships can lead to FDI positions being misclassified, under portfolio or other investment, which will result in asymmetries when comparing FDI assets and liabilities (although the discrepancies would offset and, therefore, not have an impact on global positions). While countries are recommended to apply the Framework for Direct Investment Relationships (FDIR), some economies may follow other criteria or apply more simplified methods, such as the direct influence/direct control, or the participation multiplication method.

67. **Use of Different Data Sources and Estimation Techniques.** As FDI is largely estimated from surveys, there is significant scope for asymmetries to arise due to differences in survey methods. This can include different reporting thresholds or exemptions in surveys, which may miss smaller investments (including real estate).

[30] Based on data available from BEA, Table 2.1 U.S. Direct Investment Positions at the End of the Period, accessed July 21, 2025, and IMF CDIS, 2024.

[31] On the CDIS, any positions that cannot be allocated to counterpart economy are reported as "Not specified (including confidential)."

68. **Fellow Enterprises.** Angulo and Hierro (2017) explain that asymmetries may arise when comparing inward data reported by the economy of one fellow enterprise with outward data reported by the economy of a second fellow enterprise, when the ultimate controlling parent (UCP) is nonresident in both economies. However, these asymmetries can be eliminated when comparing the net direct investment positions (outward minus inward) between the two economies, so they do not impact the global discrepancy.

69. **Immediate Versus Ultimate Investing Economy Reporting**. Differences in partner country attribution can arise if economies allocate inward direct investment positions to the ultimate investing economy instead of the immediate (first) counterpart economy. While some global databases, like CDIS, request data based on the immediate counterpart, there is always a risk of misclassification. Particularly, this can occur when all positions against the parent and other related economies are classified under the immediate direct investor or the ultimate owner.

## EXTERNAL DEBT AND OTHER INVESTMENT[32]

70. External debt statistics are essential for understanding a country's financial obligations to the rest of the world and for guiding sound economic management. Closely linked to the balance of payments framework, they provide the foundation for assessing debt sustainability, managing fiscal and monetary policy, negotiating financing terms, and maintaining transparency with investors, development partners, and citizens.

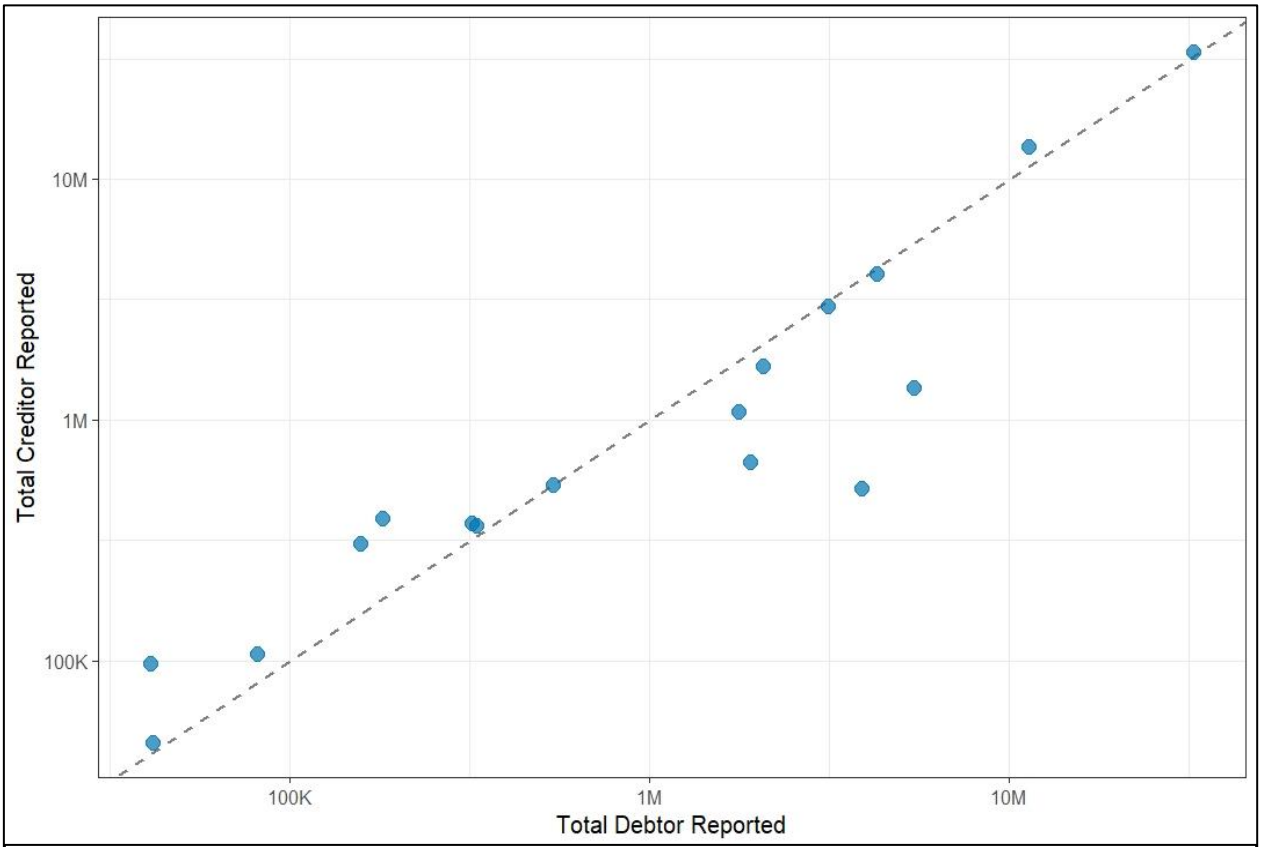
71. However, the value of these statistics depends on their accuracy and completeness, which can be compromised by creditor–debtor asymmetries—differences between what borrowers and lenders record in their respective datasets. Such mismatches can obscure hidden debt risks, distort global debt totals, undermine policy decisions, and erode market and donor confidence. When left unresolved, they can mask vulnerabilities until they erupt into debt crises, leading to economic contraction, loss of market access, social hardship, and costly restructurings. Timely detection of asymmetries is therefore a critical element of debt sustainability analysis. Mitigating these asymmetries ensures that debt data are accurate, enables countries' negotiating ability, supports credible risk assessments, and enhances global transparency, ultimately fostering more resilient economies and a more reliable international financial system.

72. Asymmetries arise from the inconsistent methodological definitions, classifications, valuation methods, and accounting practices, all of which affect comparability. Asymmetries also stem from differences in coverage, timing of recording, institutional boundaries, and incomplete or delayed reporting from either side.

73. Debt statistics originate from a diverse set of sources, broadly classified into debtor-based and creditor-based datasets. Each has unique strengths but also limitations that can lead to discrepancies (See Figure 15).

[32] This section was prepared by WS5, comprising the following members: Ms. Evis Rucaj (lead), Mr. Kenneth Egesa, and Mr. Fernando Lemos.

**Figure 15. Asymmetries Between Creditor Claims and Borrower on Debt Outstanding Position at end-2023, Thousands of U.S. Dollars**




Source: World Bank
Note: Data are for selected International Development Association (IDA) debtors & G7/Paris Club creditors. Both axes are in logarithmic scale.

74. Debtor-based data is sourced by countries that borrow, typically through institutions such as finance ministries, debt management offices (DMOs), or central banks. These data are reported to international organizations like the World Bank and IMF and include loan-level details, disbursements, repayments, and outstanding balances. Examples include the World Bank's *Debtor Reporting System* and the IMF's *Balance of Payments (BOP)* and *International Investment Position (IIP)* datasets. While such sources are rich in detail and reflect the borrower's operational realities, some of them omit or underreport certain types of debt, such as short-term borrowing, and borrowing in the form of debt securities private sector liabilities, or debt from state-owned enterprises (SOEs) without sovereign guarantees. Differences may also arise due to the main objective of the reporting unit. While the BOP and IIP compilers primarily follow statistical definitions and classifications of the BPM and EDS guides, the DMOs may focus on public debt and accounting from the point of view of debt management.

75. The creditor-based sources reflect the viewpoint of lending institutions, donor governments, commercial banks, and bondholders. These include the OECD's Creditor Reporting System (CRS), the Bank for International Settlements (BIS) statistics, and data from export credit agencies or the Paris Club. While these sources often provide better visibility into bilateral and private-sector lending, their coverage

may be limited geographically, by credit type, or in terms of the types of instruments covered. Discrepancies between these sources are at the heart of many data asymmetries. These reflect the view of those who provide financing, often more complete for bilateral and private-sector debt.

**Major Sources of Asymmetries**

76. Deviations from the standard methodology and variations among countries' compilation frameworks are the most significant causes of asymmetries in external debt statistics. These variations arise in how countries or institutions define, record, classify, and value debt instruments. For instance, the scope of coverage often differs—debtor-based systems may exclude private, non-guaranteed borrowing, while creditor-side data might capture these flows more comprehensively. Similarly, recording practices vary: some compilers adopt the accrual basis (recognizing transactions when obligations arise), while others adopt cash basis (recording when payments are made), which leads to timing and value mismatches in the data. Another common source of asymmetry is valuation, where different exchange rates or accounting methods (e.g., face value versus market value for bonds) yield different debt stock figures. There are also inconsistencies in instrument classification, such as how trade credit and advances or arrears are reported, and whether loans from SOEs or central banks are classified as public or private debt. Furthermore, differences in sectorization—how various borrowers are grouped into public or private sectors—also distort comparability. These methodological discrepancies are often embedded in both national statistical practices and international reporting frameworks, creating challenges for users trying to reconcile external debt data across sources.

77. Disparities between datasets often stem from methodological inconsistencies related to the following factors:

78. **Coverage/Scope.** Debtor sources may underreport private external borrowing, especially when it involves corporate or financial institutions without government guarantees. In contrast, creditor sources may fail to capture debt restructuring, refinancing, or loan forgiveness that are reflected in debtors' records. Such gaps in coverage are further compounded when multilateral or bilateral creditors fall outside the standard reporting frameworks, resulting in incomplete or asymmetric datasets.

79. **Recording Basis.** Some countries record debt on an accrual basis, recognizing obligations, both principal and interest, when they arise, while others use a cash basis, recording only when funds are transferred. Even when the same accounting basis is applied, debtors and creditors records may show the same disbursement or repayment in different reporting periods, sometimes months or even a fiscal year apart. In addition, the treatment of interest arrears, rescheduled payments, and grace periods can differ, creating further inconsistencies.

80. **Valuation Differences.** Exchange rate conversions may vary, with some compilers using end-of-period rates and others using period averages, differences that can be significant during times of currency volatility. Bonds and other marketable instruments may be reported at nominal (face) value by debtors, while creditors or market-based sources such as the BIS may use prevailing market values. Divergent valuation rules for inflation-indexed or floating-rate instruments can further widen the gap between datasets.

81. **Instrument Classification.** Debt instruments are not always categorized consistently across countries' reporting systems. For example, trade credits and advances may be included in external debt statistics in some countries but are unaccounted for in others. Loans extended by state-owned banks may

be classified as public debt on the creditor side but recorded as private debt by the debtor. Foreign direct investment (FDI) intercompany lending can also be treated inconsistently—some compilers accurately treat it as both a component of FDI in the BOP and IIP, as well as a component of external debt in external debt statistics, whereas others do not account it as a component of external debt, leading to notable discrepancies between the datasets.

82. **Debt Sectorization.** Differences in the classification of borrowers, particularly state-owned enterprises (SOEs), central banks, and government-guaranteed entities, can lead to significant discrepancies between datasets. Some statistical systems treat SOEs as part of the public sector, while others classify them as private unless explicitly guaranteed. Similarly, contingent liabilities and guarantees may be included in debt totals in some frameworks, but excluded until they are triggered in others, producing further divergence in reported figures.

83. **Recording practices of debt restructuring and reorganizations.** From the debtor's side—typically the debt management office or central bank—all significant changes to repayment terms are recorded as restructuring or rescheduling, with principal write-offs classified as debt forgiveness. Creditors, however, may treat some exchanges as redemptions and new issuances rather than restructuring, or may delay recognition of loan write-downs. This can lead to debtor data showing a restructuring event and reduced outstanding obligations, while creditor data reflect only an adjustment with no explicit restructuring classification. A further source of asymmetry arises from methodological shortcomings on the debtor side, particularly in countries with limited statistical capacity. Inaccurate recording of transactions and the resulting positions following debt restructuring or reorganization can generate significant discrepancies between debtor and creditor data.

84. **Other Drivers of Data Asymmetries.** Asymmetries in debt data do not accidentally stem from a combination of technical, institutional, and strategic factors. A primary driver is the difference in reporting frequency—creditor institutions may provide quarterly updates, while many developing countries only update their debt data annually—and in reporting timeliness—creditor and debtor institutions updating their statistics with different lags vis-à-vis the reference period. This temporal mismatch results in data appearing out of sync. Another key driver is capacity constraint, especially in low-income countries, where compilers may lack the tools, expertise, or legal authority to collect comprehensive data on private sector borrowing or short-term liabilities. Institutional weaknesses may allow some agencies to bypass public financial management requirements to incur debt, particularly through trade credits and advances. Strategic considerations and confidentiality also play a role—some countries may choose not to disclose politically sensitive debt, such as obligations to non-traditional lenders or loans with non-transparent terms. In addition, restructuring events, such as debt relief or reprofiling, are not uniformly classified across datasets; while one institution may record a forgiven loan as a cancellation, another may treat it as a grant or a rescheduled payment. Finally, currency conversion methods and valuation mismatches—such as reporting debt in local vs. foreign currency or using different market exchange rates—can further distort comparability. Taken together, these drivers illustrate that asymmetries are both a statistical and governance challenge.

85. Asymmetries in debt statistics—particularly between debtor- and creditor-reported data—continue to challenge the accuracy, credibility, and comparability of external debt data. These gaps arise from a variety of institutional, methodological, and operational differences. To help ESS compilers tackle these asymmetries effectively, the TT-GA can outline practical and strategic actions, drawing on international standards, peer learning, and emerging best practices.

## TOOLS TO ADDRESS ASYMMETRIES[33]

86. The work of the Task Team has focused on identifying and documenting tools that support the detection, analysis, and resolution of global asymmetries in the international accounts framework—specifically in BOP, IIP, and trade statistics.

87. Based on initial investigations, a number of tools were identified that countries and international organizations can leverage to enhance the consistency of global macroeconomic statistics. The tools identified have been grouped into seven functional categories, each addressing different aspects of asymmetry management—ranging from identification and reconciliation to communication and automation. It should be noted that these tools vary in their maturity, with some already operational, while others remain exploratory.

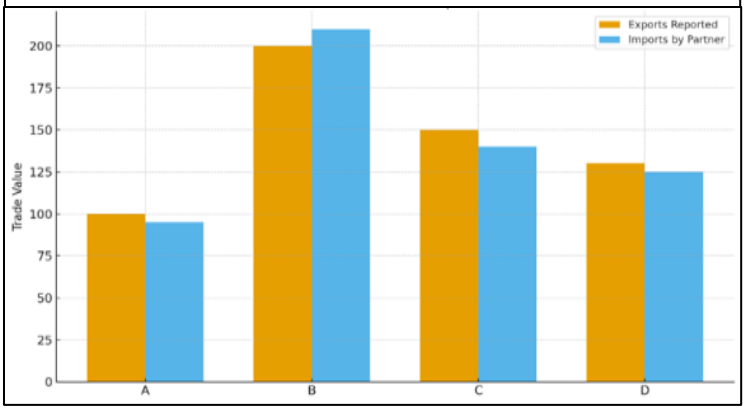
### Bilateral Comparison Platforms

88. A foundational set of tools in asymmetry analysis enables direct bilateral comparison of reported values—such as a country's exports versus its partner's recorded imports. These platforms form the analytical baseline for detecting imbalances in BOP and trade data. Examples include:

- The **IMF CDIS Asymmetries Dashboard**, visualization tool currently under development for understanding asymmetries in the CDIS dataset;
- **Eurostat's EDAMIS system**, particularly for FDI reconciliation within the EU;
- The **OECD's Asymmetries Explorer**, which enables interactive cross-country investment comparisons.

89. These platforms are often the starting point for technical discussions between partners and support ongoing reconciliation efforts by highlighting structural or systemic inconsistencies and in some cases have already contributed to narrowing bilateral gaps for example Eurostat's FDI reconciliation with the EU. As shown in Figure 16, bilateral comparison platforms provide a clear view of mismatches between reported exports and partner imports helping to initiate targeted reconciliation exercises.

**Figure 16. Bilateral Trade Reporting Discrepancies, Country A and Partners (Illustrative example)**




[33] This section was prepared by WS6, comprising the following members: Messrs. Esmond McLean (lead), Thiago Said Vieira, and Markie Muryawan, and Ms. Iman AbouHassan.

### Interactive Dashboards

90. Interactive dashboards offer dynamic tools for exploring asymmetries by geography, sector, or time (see Figure 17 for an illustrative example). Unlike static reports, they allow users to visualize and filter discrepancies in real-time, supporting timely diagnostics and stakeholder engagement. Examples include:

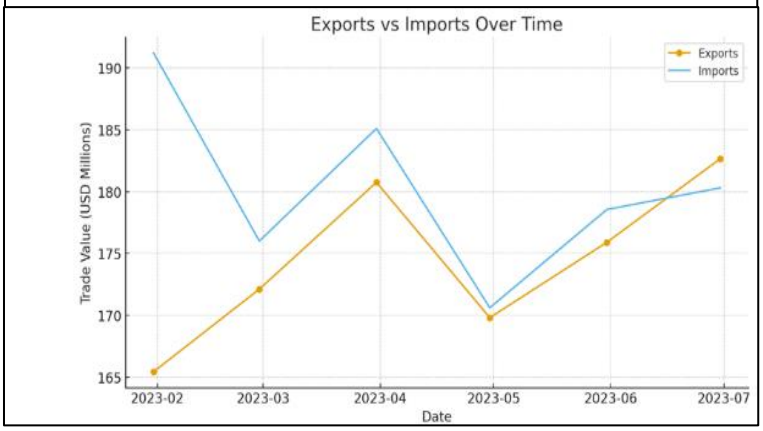
- The **IMF Direction of Trade Statistics (DOTS) Dashboard**;
- **UNCTADstat**, offering trade and investment data visualizations;
- Bespoke dashboards developed by countries using **Power BI** or **Tableau**.

91. These interfaces enhance usability and transparency, particularly in multi-stakeholder contexts, and can also improve communication of asymmetries to policymakers and the public.

### Statistical Anomaly Detection

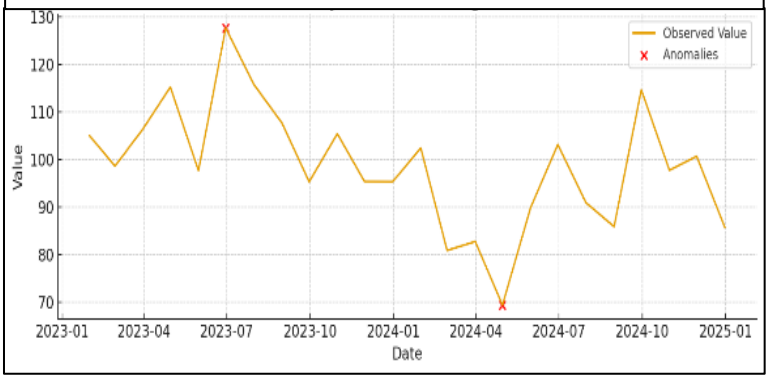
92. Statistical techniques—such as z-score analysis and SPC charts—remain among the most widely used methods to flag potential anomalies. They are frequently embedded in Excel-based reconciliation sheets or national validation systems and are valued for their simplicity and broad accessibility.

**Figure 17. Dashboard Simulation, Exports vs Imports over time (Illustrative Example)**




119. Such techniques are especially effective for routine consistency checks, though they require careful calibration to avoid false positives and have been operationalized in templates developed during IMF technical assistance (TA) missions. Statistical anomaly technique such as z-score, can highlight extreme deviations in reported flows. Figure 18 illustrates how anomalies are flagged in time-series data for routine monitoring.

**Figure 18. Anomaly Detection using z-score (Illustrative Example)**



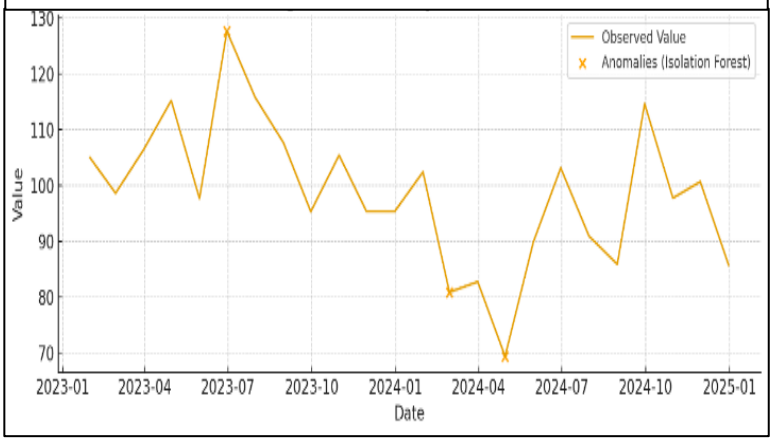

120. The diagram above illustrates a simulated line representing a time series of monthly values with anomalies flagged using a z-score greater than 2. The red marked points represent periods where the reported values deviate substantially from the historical trends. These methods are commonly used in Excel-based reconciliation tables for quality control purposes either by TA missions or assessed countries.

### Machine Learning–Based Anomaly Detection

121. More advanced data science techniques, such as **Isolation Forests**, **Autoencoders**, and **One-Class SVMs**, offer the ability to detect anomalies that may not be easily captured through static thresholds. These methods require more sophisticated computational capacity and technical expertise and are best suited for institutions managing large, complex, or high-frequency datasets.

122. While still in the exploratory phase for most statistical offices, these models represent a promising frontier for automated anomaly detection, provided sufficient high frequency datasets and computational resources are available, and could become more widely adopted as capacity expands. More advanced models, such as Isolation Forests, can detect subtler anomalies not captured by traditional thresholds. Figure 19 demonstrates how machine learning can identify such patterns.

**Figure 19. Machine Learning - Isolation Forest, Time Series with Anomalies (Illustrative example)**

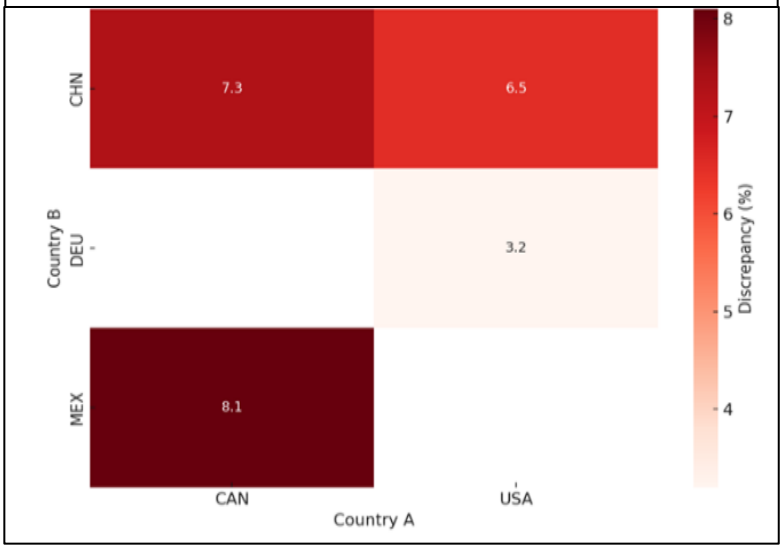



123. Figure 19 uses the same time series as the z-score illustrative example but applies an Isolation Forest algorithm to detect anomalies. The markers indicate values identified by the model as statistical outliers. This clearly shows the ability of machine learning for uncovering complex discrepancies in high-frequency data sets giving statistical community new analytical capabilities as compared to the traditional methods.

### Visualization Toolkits

124. Modern visualization libraries and platforms—such as **Plotly**, **D3.js**, **R Shiny**, and **QlikSense**—play a crucial role in translating technical findings into actionable insights. These tools help transform large datasets into accessible visual outputs, including trendlines, heatmaps, and matrix views that can be shared with both technical and non-technical audiences. Their modularity also allows integration into broader monitoring frameworks or digital platforms. Heat maps, such as Figure 20, are especially effective in visualizing cross-country discrepancies and identifying clusters

**Figure 20. Bilateral Discrepancy Heatmap, Country A vs Country B (Illustrative example)**

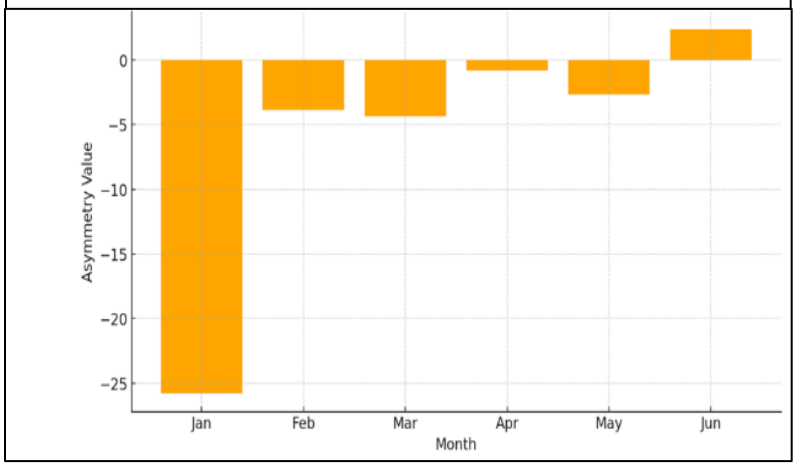


of significant asymmetries. Figure 20 uses a heatmap to present the percentage discrepancies between exports (reported) and imports for several combinations of countries. Darker red hues indicate higher asymmetries, offering a powerful lens for prioritizing bilateral investigation of data. This visualization can enhance targeted reconciliations and help countries identify reporting gaps that may be systemic.

**Custom Reconciliation Templates (Excel-Based)**

125. Excel remains a widely used tool for bilateral data reconciliation particularly in low and middle-income countries where advanced IT systems are not yet available. Custom templates—often developed in the context of IMF and ECB missions, during G20 peer reviews, or bilateral engagements—support structured comparisons, automate basic calculations, and flag discrepancies for further investigation. Features typically include: predefined formulae for discrepancy calculations; conditional formatting for alerts; dropdowns for standardized reporting; and embedded documentation for reconciliation notes. These templates are particularly effective in environments where more advanced IT systems may not be available. Routine templates often incorporate simple visualizations, such as Figure 21, which shows monthly asymmetries tracked by partner.

**Figure 21. Monthly Trade Asymmetries (Illustrative example)**




**Public Data Extractors**

126. A growing number of statistical agencies are leveraging **public APIs** and **web-based extractors** to automate data retrieval from partner countries. Examples include:

- **UN Comtrade API** for merchandise trade data;
- **IMF SDMX API** for macroeconomic datasets;
- Custom scripts developed in **Python** or **R** for web scraping and data harmonization.

127. These tools improve the efficiency of bilateral comparisons and ensure greater consistency in cross-country analyses, though regular monitoring is needed to adapt scripts when partner APIs or data structures change. It is however very useful especially as open data standards become more widespread.

## Annex II. Preliminary Set of Recommendations

**Cross-Cutting Recommendations:**

- Countries should prioritize efforts to align their external sector statistics with the latest international standards (e.g., *BPM6*, *BD4*, *IMTS*, *MSITS*, and moving forward, *BPM7, BD5,* and the forthcoming versions of *IMTS* and *MSITS*).
- Countries are encouraged to make regular comparisons to mirror data part of their standard statistical production and validation procedures and to organize regular meetings with their main trading partners/investors to cross-check bilateral data and document and address asymmetries.
- International and regional organizations should facilitate bilateral country dialogue for the reconciliation of bilateral data with main counterparts.
- International organizations, through the TT-GA, to explore and propose tools to identify and present asymmetries in bilateral data and inform the users about the known reasons behind them.
- International organizations can encourage additional reporting of partner country information, which will not only support greater identification of asymmetries but will also improve the utility of BOP data for bilateral and multilateral surveillance. The IMF could consider incorporating partner country information into its BOP and IIP dataset, potentially collecting this information on an annual basis.
- IMF, with the support from other stakeholders, to improve the country and institutional sector coverage in external sector statistics and related surveys (e.g., CPIS, CDIS) reporting.

**Targeted Recommendations and Other Ideas for Addressing Asymmetries:**

*Goods and Services Trade:*

- Countries should separately identify re-exports of goods in their BOP statistics (supplemental item in *BPM6*).
- If not already collected, countries should consider expanding their IMTS data collection to collect country of consignment information for imports of goods in addition to country of origin (as encouraged in *IMTS 2010*) to address the need for comparable partner country data.
- Countries are encouraged to start implementing *BPM7*-compliant FGP compilation early on and to coordinate with important counterpart countries and in the process of implementing to share experiences and avoid asymmetries.
- Countries are encouraged to share their aggregated data on exports or imports for certain service transactions (e.g. for insurance services, travel services, asset management costs taken out of income or dealer's margins that are both part of financial services) for which more reliable and comprehensive information is available with their main trading partners.
- IMTS compilers are strongly encouraged to prepare for future adoption of invoice values as the standard for compiling exports and imports of the goods account (as envisioned for the next

update of the manual) by taking steps towards the collection of invoice values (in addition to FOB values) as part of the IMTS collection.

*Securities:*

- **Enhanced Data Collection and Reporting.** The IMF CPIS could be expanded to include country-by-country reporting of third-party holdings. Targeted mechanisms could be developed to ensure the comprehensive inclusion of SWFs assets in the CPIS and external sector statistics. Additional efforts could be undertaken to improve the coverage of SPEs and households in the reporting of external sector statistics and in the CPIS. The IMF could engage stakeholders to expand country participation in the CPIS and external sector statistics and enhance sector coverage for currently participating countries.
- **Promote Consistency Across Jurisdictions.** The exchange of best practices on the use of security-by-security databases and the encouragement of collaboration between jurisdictions can help to minimize discrepancies arising from national reporting practices. Development of globally harmonized frameworks for reporting third-party holdings will be a key recommendation to address these significant gap in portfolio assets.
- **Strengthen International Cooperation Frameworks.** In the medium term, the international statistical community can build on existing initiatives, like the OECD's *Common Reporting Standards*, to enhance data-sharing agreements between tax authorities and statistical agencies. The community could also cooperate on facilitating coordinated efforts to address gaps in reporting from offshore financial centers.
- **Design Improved Transparency Measures.** In the medium term, the international statistical community could explore requiring tax havens to disclose beneficial ownership structures for securities held through custodial accounts and SPEs. Advanced technologies, innovations and international initiatives such as the Legal Entity Identifiers (LEI) could be exploited to trace ownership across complex chains.
- **Further Stocktaking.** In the short term, the TT-GA, with support from IMF staff, can conduct a stocktaking exercise to further assess the state of data coverage and quality for portfolio investments with selected countries that contribute most to the global asymmetries in securities. This can help to identify critical gaps in reporting frameworks for third-party holdings, tax havens, and SWFs. The findings can be used to refine and prioritize future recommendations.

*Foreign Direct Investment:*

- **Further Stock Taking.** As a first step, the TT-GA, with support from IMF staff, can conduct a stocktaking exercise to collect additional information about certain data collection and compilation issues that will help to refine the recommendations.
- **Improvements to IMF Datasets.** The breakdown of DIP and IIP statistics can be improved to allow for full comparability between both datasets. This will support identification of bilateral asymmetries and provide more consistent information to users. The IMF may also consider expanding the CDIS reporting form to account for all gross assets and liabilities.

- **Standardization of Methodologies.** Full adoption of international standards (e.g., *BPM6* and the OECD's *Benchmark Definition of FDI, fourth edition*, and moving forward, *BPM7* and *BD5*) are critical to reduce asymmetries. Recommendations in *BPM7 and BD5* manuals to limit the valuation of unlisted equity to the three recommended methods should help to limit discrepancies due to differences in valuation.

- **Data and Metadata Exchange.** Data exchange at the bilateral level has proved to be an effective way to identify and address asymmetries. This approach is most effective when detailed data, preferably at the enterprise level, can be shared.[34] The TT-GA will continue to explore ideas to address the legal barriers to such exchanges. Even if data at enterprise level cannot be shared, the exchange of information on coverage, compilation techniques, underlying coefficients, and assumptions can assist in the reduction (or at least improved understanding of) discrepancies.

- **Capacity Building Initiatives.** Capacity building would be instrumental in helping mitigate asymmetries in DI statistics. Compilers' enhanced knowledge of methodological concepts and data collection practices, as well as improved expertise in identifying the quality of reported data, could help identify source data issues. Moreover, it would help in discussing data issues with peers in other countries.

- **Workshops and the Community Hub.** The IMF, with other partners, could conduct workshops with country compilers to address typical data issues that lead to asymmetries. This work could be organized within the context of the efforts to guide implementation of *BPM7* and *BD5*. Engagement with compilers could be facilitated through the new International Community of Macroeconomic Statistics (Community Hub).

- **Additional compilation guidance.** IMF could provide additional guidance on the coverage and reporting of intercompany debt and on direct investment held by households, including real estate.

*Remittances:*

- **Standardization of Methodologies and Timeliness.** Application of uniform *BPM7* definitions, avoiding misclassification of flows, and improving timeliness of data collection and reporting are three important ways for reducing global asymmetries in data on personal remittances. This applies to both sending and receiving countries as well as to offshore financial centers.

- **Capacity Building.** IMF has a central role in providing capacity building and technical assistance to national statistical agencies and central banks. Designing spreadsheet-based templates for mapping different categories of flows to appropriate variables can help reduce misclassification (this can be done in collaboration with Work Stream 6). Countries that are large recipients (either in nominal dollar terms or as share of GDP) should devote more resources to timely and error-free data collection. Similarly, countries that are large sources should pay special attention to publishing accurate and timely data on outward remittances. At present, source countries may

[34] This approach has been successfully deployed in the European Union, for example, with the FDI Network and the FDI ARM.

sometimes not pay sufficient attention to remittances as the flows often represent a small share of their balance of payments.

- **International Cooperation.** Bilateral and multilateral cooperation of compiling countries is an important factor in reducing asymmetries. Multilateral bodies like the RemitStat Working Group play an important role in coordinating such cooperations. After the closure of KNOMAD in August 2024, the RemitStat Working Group lost sponsorship. This working group played and further on can play a major role in improving data on remittances and reducing global asymmetries. Resuscitating the RemitStat is not a difficult task considering that most members are government agencies with staffing and financial resources. A modest trust fund can revive the RemitStat Working Group as a body to coordinate compiling countries in their efforts to mitigate asymmetries in personal transfers and remittances.

- **Additional priorities that could help address asymmetries in remittances statistics include:**
  - Developing frameworks to estimate unregulated and informal flows (e.g., hawala, hand-carried cash, digital transfers, crypto assets).
  - Encouraging more frequent reporting of remittance flows (quarterly or monthly).
  - Promoting bilateral reconciliation through systematic mirror data exchanges at the corridor level.
  - Ensuring integration of new digital channels into official statistics, applying *BPM7* guidance.

*External Debt:*

*Institutional Strengthening & Data Governance*

- **Enhance Coordination.** Foster collaboration among central banks, debt management offices, finance ministries, and statistical offices. Use formal platforms (e.g., committees, working groups) and MoUs to align data sharing, especially for guarantees and SOE obligations.

- **Strengthen Legal Mandates.** Update laws to ensure compilers can collect comprehensive data from both public and private entities, including private sector debt and contingent liabilities.

*Methodological Improvements & Data Practices*

- **Adopt International Standards.** Fully implement *BPM6/BPM7* and the IMF/World Bank *EDS Guide*. Stay updated on evolving standards.

- **Improve Classification and Sectorization.** Ensure consistent identification of sectors and instruments, including contingent liabilities and guarantees.

- **Harmonize Valuation Practices.** Use transparent, consistent exchange rate and valuation methods to support reconciliation.

- **Expand Coverage.** Compilers can use surveys and administrative data to better capture private and short-term debt.

- **Improve Temporal Consistency.** Align recording periods and reporting calendars with creditors to reduce timing mismatches.

*External Collaboration & Reconciliation*

- **Bilateral Data Reconciliation.** Regularly compare debtor and creditor datasets (e.g., OECD, BIS, World Bank DRS) to identify and resolve mismatches.
- **Participate in International Initiatives.** Engage in QEDS, SDDS/e-GDDS, and Debt Transparency initiatives for visibility, comparability, and peer learning.
- **Share Metadata.** Publish clear notes on data sources, methods, and limitations to aid understanding and transparency.

*Capacity Building & Technology Use*

- **Invest in Training.** Build staff capacity in debt classification, reconciliation, and interpretation of creditor-side data.
- **Leverage Technology.** Develop integrated, automated systems to link BOP, IIP, and EDS databases, minimizing manual errors and modernizing workflows.

## Annex III. Catalog of Previous Reports on Asymmetries

| Report/Paper | Authoring Institution | Pub. Year | BOP Account/s Covered | Link (if available) | Countries |
|---|---|---|---|---|---|
| Understanding the Canadian international merchandise trade balance | Statistics Canada | 2025 | Goods | https://www.statcan.gc.ca/en/statistical-[...] | Canada, US |
| Improving the quality of balance of payments statistics via granular bilateral analysis | Banca d'Italia, European Commission, European Central Bank, Banco de España | 2024 | BOP+IIP | https://airdrive.eventsair.com/eventsair[...] | Austria, Italy, Spain |
| Quality report on balance of payments (BOP), international investment position (IIP), international trade in services (ITS) and foreign direct investment statistics (FDI) | Eurostat | 2023 | Current Account | https://ec.europa.eu/eurostat/documents/[...] | EU member countries |
| Guide to OECD Trade in Value Added (TiVA) Indicators | OECD | 2023 | Goods and Services | https://stats.oecd.org/wbos/fileview2[...] | Multiple |
| Reasons for trade in goods asymmetries | HMRC (UK) | 2023 | Goods | https://www.gov.uk/government/publications/[...] | UK, EU members |
| Decoding global services trade: The power of the OECD-WTO BaTIS dataset | OECD | 2023 | Services | https://oecdstatistics.blog/2023/[...] | Multiple |
| Jt Working Group Asymmetry Analysis Report on Bilateral Merchandise Trade Stats | US Census Bureau, Ministry of Commerce and Industry (India) | 2023 | Goods | https://www.census.gov/foreign-trade/[...] | US, India |
| Trade in services asymmetries-the challenges of measuring imports and exports | ONS (UK) | 2022 | Services | https://www.ons.gov.uk/businessindustryandtrade/internationaltrade/methodologies/tradeinservicesasymmetriesthechallengesofmeasuringimportsandexports | UK |
| US – UK Asymmetry Analysis 2017 - 2022 | US Census Bureau, HMRC Department of International Trade (UK) | 2022 | Goods | https://www.census.gov/foreign-trade/reconciliation/[...] | US, UK |

| | | | | | |
|---|---|---|---|---|---|
| United States-Ireland Asymmetry Analysis Report on Differences | US Census Bureau, CSO (Ireland) | 2021 | Goods | https://www.census.gov/foreign-trade/[...] | US, Ireland |
| Current-Account Asymmetries in US-EU Statistics | US BEA, Eurostat | 2019 | Current Account | https://www.bea.gov/sites/default/files/[...] | US, EU |
| IMTS Bilateral asymmetries – how to measure, analyze, reduce and way forward | UNSD | 2019 | Goods | https://comtradeapi.un.org/files/v1/app/[...] | Multiple |
| Comparing Canadian and US bilateral trade in goods data | Statistics Canada | 2018 | Goods | https://www150.statcan.gc.ca/n1/pub/[...] | Canada, US |
| Asymmetries in trade data: extending analysis of UK bilateral trade data | ONS (UK) | 2018 | Goods and Services | https://www.ons.gov.uk/economy/nationalaccounts/balance[...] | UK, US, Ireland Germany, France, Netherlands, Belgium, Luxembourg |
| Comparing Canada's and China's bilateral trade data | Statistics Canada | 2018 | Goods and Services | https://www150.statcan.gc.ca/n1/pub[...] | Canada, China |
| Understanding Asymmetries Between BEA's and Partner Countries' Trade Statistics | US BEA, ONS (UK) | 2018 | Goods and Services | https://apps.bea.gov/scb/issues/2018/02-[...] | US, UK |
| An Overview on the Construction of North American Regional Supply-Use and Input-Output Tables and their Applications in Policy Analysis | INEGI (Mexico), StatsCanada, US BEA, US Census Bureau, US ITC | 2017 | Goods | https://www.usitc.gov/publications/332/working_papers[...] | US, Canada, Mexico |
| Transatlantic Trade in Services: Investigating Bilateral Asymmetries in EU-U.S. Trade Statistics | US BEA, European Commission | 2017 | Services | https://www.bea.gov/sites/default/files/[...] | US, EU |
| US-Brazil Commercial Dialogue/Trade Facilitation WG | US Census Bureau, Brazil Ministry of Development, Industry, and Foreign Trade (MDIC) | 2015 | Goods | https://www.census.gov/foreign-trade/[...] | US, Brazil |
| International portfolio choice and corporation finance: A synthesis | Academic Journal (The Journal of Finance) | 1983 | Portfolio investment, FDI | https://onlinelibrary.wiley.com/doi/10.1111/j.1540-6261.1983.tb02511.x | Global/theoretical framework |
| Who owns the wealth in tax havens? Macro evidence and implications for global inequality | EU Tax Observatory | 2018 | Portfolio investment (offshore wealth) | https://www.taxobservatory.eu/repository/who-owns-the-wealth-in-tax-havens-macro-evidence- | Global (by country breakdown) |

| | | | | | |
|---|---|---|---|---|---|
| | | | | and-implications-for-global-inequality/ | |
| Tax evasion and inequality | Academic Journal (American Economic Review) | 2019 | Portfolio investment (offshore wealth) | Available via academic databases | Global focus on wealthy countries |
| Global Tax Evasion Report 2024 | EU Tax Observatory | 2024 | Portfolio investment (offshore wealth) | Available via EU Tax Observatory | Global |
| Breaking free of the triple coincidence in international finance | Bank for International Settlements | 2016 | All BOP categories (current account, capital account, financial account) | https://academic.oup.com/economicpolicy/article-abstract/31/87/409/2918416 | Global (with examples from Asian crisis, Korea) |
| The geography of the great rebalancing in euro area bond markets during the sovereign debt crisis | European Central Bank | 2016 | Portfolio investment (debt securities) | https://linkinghub.elsevier.com/retrieve/pii/S0927539816000049 | Euro area countries (stressed vs non-stressed) |
| Cross-border investment in emerging market bonds | Hutchins Center/Brookings Institution | 2023 | Portfolio investment (debt securities) | https://www.brookings.edu/wp-content/uploads/2023/02/WP84-Bergant-et-al_2.21.pdf | Emerging markets (focus on BRICS) |
| International capital flows at the security level: evidence from the ECB's Asset Purchase Programme | European Central Bank | 2020 | Portfolio investment (securities) | Available via ECB Working Papers | Euro area |
| Comparing UK tax returns of foreign multinationals to matched domestic firms | Academic Journal (American Economic Review) | 2019 | Corporate tax data (related to profit shifting) | https://www.aeaweb.org/articles?id=10.1257%2Faer.20180496 | United Kingdom |
| A literature review of securities holdings statistics research and a practitioner's guide | De Nederlandsche Bank | 2022 | Portfolio investment (securities holdings) | https://www.dnb.nl/media/czpnnmuc/working_paper_no-757.pdf | Euro area |
| How to identify hidden securities assets in the Balance of Payments: Methods of Bank of France | Bank of France | 2019 | Portfolio investment (securities) | https://www.bis.org/ifc/publ/ifcb49_08.pdf | France (methodology applicable globally) |
| Where are the hidden securities in external statistics? | European Central Bank & World Bank | 2024 | Portfolio investment (securities) | https://www.bis.org/ifc/publ/ifcb62_30.pdf | Global (focus on euro area financial centers) |
| The use of Securities Holdings Statistics (SHS) for designing new euro area financial integration indicators | European Central Bank | 2015 | Portfolio investment (securities) | https://www.bis.org/ifc/events/7ifcconf_fache-rousova_rodriguez-caloca.pdf | Euro area |
| Financial transparency and anomalous portfolio investment flows: A gravity analysis | Academic Journal (Journal of International Money and Finance) | 2022 | Portfolio investment | https://www.sciencedirect.com/science/article/abs/pii/S0261560622001073 | Global (214 countries) |
| Possible Sources of Statistical Discrepancies in International | International Monetary Fund (IMF) | 2016 | All BOP categories | Available via IMF BOPCOM | United States |

| | | | | | |
|---|---|---|---|---|---|
| Accounts: Lessons from the U.S. Experience | | | | | |
| The price of offshore revisited: New estimates for missing global private wealth, income, inequality, and lost taxes | Tax Justice Network | 2012 | Portfolio investment (offshore wealth) | https://www.taxjustice.net/cms/upload/pdf/The_Price_of_Offshore_Revisited_Presser_120722.pdf | Global (focus on developing countries) |
| The External Wealth of Nations Revisited: International Financial Integration in the Aftermath of the Global Financial Crisis | International Monetary Fund (IMF) | 2018 | All BOP categories (external assets and liabilities) | Available via IMF | Global (200+ countries) |
| Many Creditors, One Large Debtor: Understanding the Buildup of Global Stock Imbalances after the Global Financial Crisis | International Monetary Fund (IMF) | 2023 | Portfolio investment, FDI | Available via IMF | Global |
| Wealth in Italy: A never-ending story | Bank of Italy | 2016 | Household wealth (partial BOP coverage) | Available via Bank of Italy | Italy |
| In search of lost capital: An estimation of undeclared portfolio assets | Bank of Italy | 2012 | Portfolio investment | Available via Bank of Italy | Italy |
| The difficulties attached to the collection of information on households' holdings of securities: third party reporting | Bank for International Settlements | 2007 | Portfolio investment (securities) | https://www.bis.org/ifc/publ/ifcb25.htm | Not specified (methodological) |
| An assessment of euro area households' missing foreign assets | European Central Bank | 2021 | Portfolio investment (household foreign assets) | https://www.bis.org/ifc/publ/ifcb55_20.pdf | Euro area |
| Missing Assets: Exploring the Source of Data Gaps in Global Cross-Border Holdings of Portfolio Equity | Centre for Economic Policy Research (CEPR) | 2024 | Portfolio investment (equity securities) | | Global (focus on Ireland, Luxembourg, United States) |

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