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Improving the quality of balance of payments statistics via granular bilateral analysis - trilateral comparison: Austria, Italy and Spain[1]

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[1] This contribution was prepared for the conference. The views expressed in this publication are those of the authors and do not necessarily represent the official views of the Committee, its members, or the BIS.

Improving the quality of balance of payments statistics via granular bilateral analysis - Trilateral comparison: Austria, Italy, and Spain

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Abstract

Our research focuses on improving balance of payments (b.o.p.) and international investment position (i.i.p.) statistics through a trilateral country comparison. Our method takes a comprehensive view of the overall b.o.p./i.i.p., unlike previous studies that focused on specific subsets of data, to identify and address inconsistencies in the statistics. Through collaborative efforts and secure data sharing, we detect systematic patterns and prioritise the analysis of key breakdowns that mainly contribute to bilateral inconsistencies. By facilitating effective data reconciliation, our research enhances the accuracy and reliability of b.o.p./i.i.p. statistics. This empowers policymakers, economic analysts, and the public to make better-informed decisions based on high-quality international economic data.

Keywords: Asymmetries, mirror data, balance of payments, foreign direct investment

JEL classification: C82, E01, F21, F23

[1] This paper should not be reported as representing the views of the European Central Bank (ECB). The views expressed are those of the authors and do not necessarily reflect those of the ECB..

Contents

1. Introduction

The balance of payments (b.o.p.) and international investment position (i.i.p.) summarise an economy's international transactions and positions, providing a comprehensive account of the economic and financial linkages between its residents and the rest of the world. B.o.p./i.i.p. statistics are fundamental indicators to assess a country's economic performance, exchange rate policy, reserves management and external macroeconomic imbalances. The availability of high-quality b.o.p./i.i.p. statistics is key to ensure policymakers, economic analysts and the public at large can access adequate and reliable information on developments in cross-border trade and international capital flows, on exposures to external shocks and on the international transmission of monetary and fiscal policies.[2]

In the context of the compilation of b.o.p./i.i.p. statistics, the quality of statistical output is analysed on a regular basis according to several criteria: methodological soundness and statistical procedures; timeliness and punctuality; data and metadata availability; accuracy and reliability; internal consistency; external consistency/coherence with other comparable statistical domains; size and persistency of bilateral asymmetries.[3] This last feature, negatively affecting the quality of data, is typically observed in statistics where the geographical location of the counterparty is captured and mirror information can be obtained from data published by the counterparty country. For example, direct investment from country A into equity issued by country B is independently measured both by country A (as asset vis-à-vis country B) and by country B (as liabilities vis-à-vis country A). When the two countries use comparable methodologies to collect and compile data, the two observations should be equal as they measure the same phenomenon. However, this is not often the case due to e.g. the way statistical concepts are interpreted or differences in data collection sources and in statistical estimation methods. The size of the existing discrepancy in mirror statistics is labelled *bilateral asymmetry*. Significant and persistent bilateral asymmetries adversely affect the quality of official statistics, their credibility and usability as a basis for sound policy advice as data users may obtain contradicting messages depending on the data source used.

The presence of sizeable bilateral asymmetries in cross-border statistics has been a growing concern for compilers and users of b.o.p./i.i.p. statistics. The increased complexity of global production and financing networks (e.g. due to factory-less production, merchanting arrangements, tax-optimisation strategies, relevance of intangible assets) has, in turn, increased the complexity of the measurement process, as well as the scope for emergence of asymmetries in the published data. Damgaard and Elkjaer (2017) and Angulo and Hierro (2017) document the large global and bilateral asymmetries in FDI data reported in the Coordinated Direct Investment Survey (CDIS) and discuss the main reasons behind them. Pastoris and Schmitz (2020) show how the large asymmetries in the bilateral euro area – United States current

[2] For an overview of the analytical value of external statistics see Lane, P.R., The analytical contribution of external statistics: addressing the challenges, speech at the conference on "Bridging measurement challenges and analytical needs of external statistics: evolution or revolution?", Lisbon 17 February 2020

[3] As an example see The Euro area and national balance of payments and international investment statistics: Quality report 2021, a biennial report providing a quality review of the national b.o.p., i.i.p. and international reserves, as well as the associated euro-area aggregates.

account are linked with asymmetric treatment of foreign direct investment income, in turn affected by the complexity of ownership structure of large multinationals. Jellema et al (2020) provide a comprehensive overview of the phenomenon of asymmetries in cross-border statistics, summarising the different analytical tools to measure them, listing the existing studies by countries 'statistical agencies and international organisations (e.g. Central Statistics Office (2016), Bureau of Economic Analysis (2018), Eurostat (2019), Office for National Statistics (2020)) and suggesting a novel framework to assess the structural dimension of asymmetries between a country and a group of counterparties: this is particularly useful in case of complex FDI operations affecting the data of several countries at the same time.

At the European level, where the quality and consistency of the geographical breakdown is key to produce meaningful euro area/EU aggregates for the b.o.p./i.i.p.[4], several initiatives are in place to better understand asymmetries and, where possible, to prevent or reduce them by ensuring consistent recording of statistical events across Member States. Regular analysis of the developments in intra-euro area/EU asymmetries is now included in Quality reports on b.o.p./i.i.p. data produced by the ECB and Eurostat. Member States are encouraged to extensively use the FDI Network, an infrastructure which allows sharing confidential micro-data on large FDI operations between the involved countries with the aim to match and reconcile the exchanged statistical information. The Asymmetry Resolution Mechanism for FDI (FDI ARM) is a quarterly exercise to resolve the largest outstanding bilateral asymmetries in the EU, where experts from the countries involved in these large asymmetries engage in virtual discussions to address them in a collective manner. Microdata information shared in the FDI network is the basis for the FDI ARM discussion, enriched with additional metadata and investigations once a particular FDI event is in focus. An Asymmetry Resolution Mechanism for Trade in Services (ITSS ARM) was then launched in 2022 to address the most important asymmetries among the data of EU member states. An Early Warning System was established in 2017 to detect restructuring events of MNE groups and ensure their consistent statistical recording in European statistics. The European Network of Multinational Enterprise Coordinators (MNEnet) was established in 2021 to strengthen the cooperation of European MNE experts and ensure that knowledge on statistical treatment of MNEs is flowing to all statistical domains and countries.

Our paper contributes to the existing initiatives on improving the quality of b.o.p./i.i.p. statistics by presenting a framework for an in-depth comparison and reconciliation of granular b.o.p./i.i.p. statistics in a trilateral fashion. First, while existing studies mostly focus on bilateral data comparisons only for a specific subset of the b.o.p/i.i.p. (e.g trade in goods; trade in services; current account; FDI), our exercise covers the full b.o.p./i.i.p. of the involved countries to provide a comprehensive overview of the bilateral quality of the external account. This is in line with the approach taken in Timmermann B. (1997), where the bilateral b.o.p. data of Portugal and Germany is analysed and reconciled. While covering the whole b.o.p./i.i.p., we also suggest a way to prioritise the in-depth analysis and reconciliation for those detailed breakdowns which contribute most to the overall b.o.p. bilateral inconsistency. Second, our framework involves a trilateral exercise with bilateral

[4] For the euro area b.o.p./i.i.p. only the transactions/positions vis-à-vis non-residents of the euro area matter; transactions and positions vis-à-vis other euro-area countries should instead be consolidated and, in the absence of asymmetries, they should amount to zero in net terms. For additional information on asymmetries in euro area b.o.p./i.i.p. see Jellema et al (2020).

b.o.p./i.i.p. comparisons involving a group of three countries: this helps detecting systematic patterns on the bilateral data, as a single country's data is analysed in detail against the information provided by two counterparties. The trilateral setting of the exercise also allows some additional learning experience from sharing information and discussing reconciliation possibilities on a more extensive setting. Additionally, this setting allows for in-depth comparisons between country pairs which are rarely involved in exchanges in the existing European initiatives on asymmetries as these are often targeted towards the largest operations, which, in turn, are mostly concentrated in a small set of other counterparty countries. Finally, our exercise suggests a practical way on how countries can organise such data comparison exercises, emphasising the importance of sharing targeted microdata to allow in-depth analyses for the reconciliation of the main asymmetries. Sharing microdata in a safe and protected fashion is key to solve bilateral inconsistencies in b.o.p./i.i.p. data as it allows detailed and precise follow-up investigations.

The remainder of the paper is organised as follows. Section 2 introduces the framework for the granular analysis of b.o.p./i.i.p. data, describing the different activities for analysing and reconciling data. Section 3 shows how this framework was applied in a pilot project involving the comparison of b.o.p./i.i.p. of Austria, Italy and Spain. The main reasons behind asymmetries and an overview of the reconciliation efforts are discussed. Section 4 presents some suggested initiatives for further improving the quality of bilateral b.o.p./i.i.p. data. Section 5 contains concluding remarks.

2. A framework for granular bilateral b.o.p./i.i.p. analyses in a trilateral setting

2.1 Setting-up a trilateral comparative exercise

The mechanisms already in place within the EU to address bilateral asymmetries (such as the FDI Network and the Asymmetry Resolution Mechanisms) target very specific b.o.p. items and normally focus on very large operations/asymmetries. The results of these mechanisms have been very positive and contributed to the overall enhancement of the data quality of b.o.p./i.i.p.. However, they have mainly involved only a few EU countries, given the thresholds for operations to be discussed.[5]

The framework on bilateral matching of b.o.p. in a trilateral setting put forward in this paper addresses the participation limitations within the current mechanisms. It allows for an in-depth and comprehensive analysis of all items of b.o.p./i.i.p. accounts, also for country pairs that do not regularly participate in the asymmetry resolution mechanisms and other EU networking initiatives, due to the more limited size of their bilateral data.

The concept of bilateral comparison in a trilateral setting is very simple: three countries simultaneously take part in a bilateral comparison of their b.o.p./i.i.p. data. Data is compared bilaterally across the three participating countries, in a way that

[5] The threshold for exchanging operations in the FDI network is 2 billion EUR, while only bilateral asymmetries in FDI transactions larger than 10 billion EUR are considered in the FDI ARM. As a result, mostly the Netherlands, Luxembourg and Ireland are involved as counterparties in these exchanges.

each country is involved in comparisons against the two other counterparties. The exercise would normally involve countries with a strong interest in improving the quality and consistency of their mutual data, such as relevant trade and/or financial partners, countries with similar structure in the external accounts, or with *ex-ante* knowledge of existing sizeable discrepancies in their data and/or compilation methods.

The choice of having a trilateral setting brings more balance to the country discussions and allows an easier detection of systematic patterns on the bilateral data, as a single country's data is analysed in detail against the information provided by two counterparties. Keeping the involved number of countries small allows a fully in-depth and thorough investigation of the reasons behind the bilateral asymmetries, without dispersing efforts in many investigations across a large number of partner countries.

Each of the three countries expressing interest in running such trilateral comparative exercise would nominate one b.o.p./i.i.p. expert as the main contact person for the exercise. The main contact person would participate to all the activities of the comparative exercise and be responsible for setting their pace and efforts. However, given that the exercise spans over the full b.o.p./i.i.p. and requires very specific knowledge on all the b.o.p./i.i.p. accounts, each main contact person should deal at the national level with experts from the different b.o.p./i.i.p. domains to clarify specific topics and carry out in-depth investigations.

The main steps foreseen in the framework for the bilateral comparison of b.o.p./i.i.p. in a trilateral setting are the following:

- Qualitative analysis on statistical methodology, methods and reporting systems
- Quantitative data comparison and prioritisation strategy
- Investigation of granular asymmetries and addressing reconciliation efforts

2.2 Qualitative analysis on statistical methodology, methods and reporting systems

The compilation of b.o.p./i.i.p. is currently based on the sixth edition of the Balance of Payments and International Investment Position (BMP6) manual.[6] Although the methodological basis for b.o.p./i.i.p. statistics is well defined in BPM6, the practical compilation of b.o.p./i.i.p. also requires, in some instances, an interpretation of the BPM6 manual, the alignment of different data sources, as well as data collection and compilation methods choices.

The first step of our comprehensive comparative framework is thus to understand possible structural causes of bilateral asymmetries across the three involved countries due to: i) deviations from BPM6 methodology; ii) different data collection processes; iii) different compilation methods. As BPM6 is the common

[6] See the online version of the BPM6 manual: https://www.imf.org/external/pubs/ft/bop/2007/pdf/bpm6.pdf

methodological manual to be followed by b.o.p./i.i.p. compilers worldwide, deviations from BPM6 methodology should be rare and, when present, be rather of a temporary nature, with a clear plan for their overcoming. Differences due to data collection processes may emerge as b.o.p./i.i.p. data collection includes different types of data sources such as the use of direct reporting (e.g., from nonfinancial corporations on a monthly basis), surveys (e.g., sample surveys on annual basis) or administrative data (e.g., tax information). Compilation methods may be at the origin of structural discrepancies in b.o.p./i.i.p. data as they may involve adjustments to national data sources, benchmarking to other datasets (e.g., using mirror data), or using statistical models based on indicators.

2.3 Quantitative data comparison and prioritisation strategy

The second step in our framework is a quantitative comparison of the bilateral b.o.p./i.i.p. data of the three involved county pairs. Depending on the available level of detail, the comparison can address a more restricted or more expanded set of b.o.p./i.i.p. indicators. As a minimum level, the main categories of the current account (goods, services, primary income, secondary income), the capital account and the functional categories of the financial account and the international investment position are to be compared.

While quarterly bilateral data may be available, it is preferable to use yearly data in this type of exercise to smoothen out quarterly temporal mismatches and focus only on other main reasons for asymmetric results. Also, while the calculation of asymmetries is done at the yearly level, several years of data should ideally be analysed in order to distinguish structural discrepancies recurring every year from year-specific sources of discrepancies.

Country pair data tables were created for the three country pairs involved according to a common template. These data tables included bilateral detailed data, together with the size of the corresponding bilateral discrepancy (if any). The tables provided the basis for the initial quantitative investigation of the size and relevance of the asymmetries in the different b.o.p./i.i.p. items. For each b.o.p./i.i.p. item and for each country pair, two asymmetries emerge, one for credits (assets) and another for debits (liabilities).

With regards to the prioritisation strategy, different selection methods can be used to determine the b.o.p./i.i.p. details to be later investigated:

- Absolute size of the largest bilateral discrepancies: for each country pair, only the b.o.p./i.i.p. items which show the largest (absolute) size of asymmetries are selected/prioritised.

- Relative size of the largest bilateral discrepancies: for each country pair, only the b.o.p./i.i.p. items which show the largest size of asymmetries, relative to the combined size of the bilateral flows/stocks, are selected/prioritised.

- Synthetic relevance asymmetry indicator: a synthetic indicator which shows, for each country, the relevance of each of its b.o.p./i.i.p. items in the overall b.o.p./i.i.p. asymmetries vis-à-vis the group of counterparties.

The prioritisation strategy could also use a combination of all these methods/criteria, possibly together with some additional information on items of interest from the qualitative analysis of the comparative b.o.p./i.i.p. methods.

2.4 Investigation of asymmetries and addressing reconciliation efforts

The detailed investigations of the reasons behind the discrepancies in the selected b.o.p./i.i.p. items were the core activity in our framework.

For items where it is possible to investigate the granular operations/events behind bilateral asymmetries (e.g., FDI transactions), an exchange of micro-data on such operations was key. Exchanging this information at the most granular level allowed the identification of the individual operations driving the bilateral asymmetries. The investigation included sometimes contacting the reporting agent, reviewing the information collected in the past and analysing again the balance sheet to get a consistent view of the analysed operation/event.

In-depth investigations made use of additional data sources to obtain information to complement the b.o.p./i.i.p. aggregate data (e.g. registers to investigate the resident population, using AnaCredit data[7] on counterparties of loans, using BSI[8] interbank data to understand the asymmetries from the inter-banking sector positions).

For items where the use of estimations, modelling or assumptions is very relevant (e.g., travel services), in-depth investigations focused on understanding the impact and reliability of the modelling framework/assumptions, also in comparison with the mirror data. In these cases, the trilateral framework was very useful as some possible under/overestimation of data vis-à-vis both partner countries provided useful information on possible refinements to the modelling/estimation framework.

Once the investigation phase was completed, there was a clear assessment of the results obtained and a timeline for the implementation of the reconciled results. It is important here to distinguish between:

- Reconciliation results that can be implemented in the short-term (e.g., correction of wrong reporting, agreement on a different treatment of a corporate restructuring case), where corrected data is to be published in the first available revision window;
- Reconciliation results that can be implemented in the medium-term (e.g. in the occasion of a benchmark revision or revision of the international manuals), for corrections in the data that require more structural changes in data sources or further methodological clarifications;
- Investigations resulting in unreconciled differences, for those cases where it is unclear where the discrepancies originate, or where the involved countries do not manage to agree on a similar treatment.

[7] The Analytical Credit Datasets (AnaCredit) of the ECB covers confidential data on loans granted and/or serviced by Monetary Financial Institutions that are resident in the Euro Area or resident in a non-Euro Area but with headquarters in a Euro Area country. The data in AnaCredit includes only loans to legal entities (no natural persons/ private households) and is compiled on a monthly basis, as of September 2018. REGULATION (EU) 2016/ 867 OF THE EUROPEAN CENTRAL BANK - of 18 May 2016 - on the collection of granular credit and credit risk data (ECB/ 2016/ 13) (europa.eu)

[8] BSI data include balance sheet information of monetary financial institutions (MFIs) (https://data.ecb.europa.eu/data/datasets/BSI/data-information)

Besides the immediate reconciliation effects, the trilateral comparison and matching contributed to the exchange of compilation methods (i.e. using additional data sources), and strengthened the network between the participating central banks experts on b.o.p./i.i.p. topics.

3. A trilateral comparison: Austria, Italy and Spain

3.1 Operational set-up of the trilateral exercise

The trilateral comparison of b.o.p./i.i.p. data was set-up for Austria, Italy and Spain.[9] The exercise, coordinated by the ECB, took place virtually between the months of October 2022 and April 2023, during which the three contact persons from the participating institutions (the central banks of Austria, Italy and Spain) could dedicate around one third of their full-time working time to this project.

A common virtual space for the trilateral exercise was created with restricted access to guarantee a protected exchange of bilateral data, confidential micro-data on the results of the detailed investigations and information on the different methods and compilation choices. Virtual contact points between the ECB and the three country contact persons were organised every second week, with the possibility of more frequent contacts between the country participants to discuss their activities in more detail.

Bilateral annual comparison tables of the b.o.p./i.i.p. details of the three participating countries were prepared by the ECB, based on quarterly bilateral data sent to the ECB in the context of the b.o.p./i.i.p. guideline[10], and shared with the country participants. The data for the exercise was based on the October 2022 quarterly data vintage[11]. The quarterly data were aggregated to yearly frequency to smoothen out temporarily mismatches, and the focus of the comparative analysis was set on the years 2019, 2020 and 2021, for two main reasons. First, the time series dimension allows to distinguish potential structural discrepancies in the data from discrepancies which are only limited to one occurrence. Second, an important consideration was that 2019 is considered already a final vintage of data, while 2020 and 2021 can still be subject to vintage revision issues as well as potential specific additional data quality challenges related to the extraordinary pandemic-related issues in data collection and compilation. Thus, considering these three years sounded like a balanced decision to detect both structural and idiosyncratic discrepancies in the data.

[9] Within the context of the virtual ESCB Schuman programme, an initiative by the ESCB to foster external mobility among staff. It consists of projects on a topic of interest for the hosting/coordinating institution, where colleagues from visiting institutions can be involved physically or virtually.

[10] See here: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02011O0023-20220516

[11] Normally the October data vintage includes longer revision periods for country data and thus also previous periods are regularly revised.

3.2 Differences emerging from the qualitative analysis

The analysis of the comparative country tables on methodology, methods and source data showed that the methodology of the three countries is mostly aligned with the international standards. This finding is not unexpected since the alignment of euro area countries 'b.o.p./i.i.p. data with the international methodology is regularly checked, assessed and encouraged at national and European level[12].

In other investment, potential structural causes of asymmetries emerged from the different use of specific data sources across the three countries, such as mirror data based on BSI statistics[13] and BIS locational banking statistics[14] for deposits and loans (see paragraph 3.4.3 for additional details). Another difference was the use of micro-data for quality assurance during the compilation phase to find reporting mistakes or missing information and correct it.

Concerning deviations in foreign direct investment (FDI), a case was observed in Spain. Transactions and positions in trade credits and advances are always classified as other investment, even when they occur between entities in an FDI relationship. Therefore, they are not included in the FDI functional category, causing a structural discrepancy. Moreover, due to missing data sources on exact geographical counterparties, the regional breakdown is estimated based on the known geographical proportions in exports and imports of goods and services. These geographical estimates can have an impact on the bilateral comparison under discussion.

The valuation of unlisted and other equity was another well-known challenging item in FDI, which can bring structural discrepancies across countries. There is methodological guidance in the BMP6 manual, offering a list of alternative methods when the market prices are not observable[15]. However, if the partner countries opt to apply two different methodologically acceptable methods, bilateral asymmetries can structurally arise for the same unlisted equity position (see paragraph 3.4.2 for additional details).

3.3 Size of data asymmetries and prioritisation choices

The analysis of bilateral asymmetries in the three countries, combined with qualitative analysis of methods and data sources, led us to prioritize the in-depth investigations of 3 items from the current and capital accounts, 3 items from the financial account, and 1 item from the i.i.p.. Furthermore, we also looked at FDI income because it is closely related to FDI equity positions. An overview of the prioritised items for each country pair is shown in Figure 1.

[12] See, for example, the Euro area and national balance of payments and international investment position statistics – 2021 Quality Report and the European Union Balance of Payments and International Investment Position statistical sources and methods – "B.o.p. and i.i.p. e-book", October 2023.

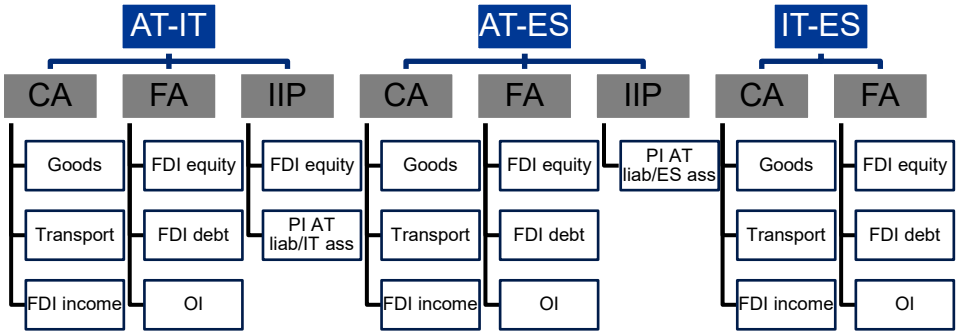
[13] The balance sheets of monetary financial institutions (MFIs) (europa.eu)

[14] Locational banking statistics (bis.org)

[15] For more details, see "Chapter 7. International Investment Position, B Direct Investment" of the BPM6

Prioritised b.o.p./i.i.p. items for the in-depth investigations

Figure 1



Notes: The chart shows the item prioritised for each country pair. Liab. = liabilities; Ass.= assets.

3.4 Main reasons for asymmetries and reconciliation results

3.4.1 Goods and transport services

As mentioned in Section 3.3, relevant and recurrent asymmetries between the three countries emerged for goods, being particularly relevant for the overall current account asymmetries of Italy and Spain.

Compilation of goods exports/imports in b.o.p. starts from source data from the international trade in goods statistics (ITGS), usually compiled by the National Statistics Institute (NSI). ITGS data record exports and imports of goods when the physical flow of goods passes across borders. In b.o.p. what matters is instead the change of the economic ownership between residents and non-residents. The ITGS information needs thus to be adjusted for b.o.p. purposes to move away from the concept of the physical crossing of goods across borders to the concept of cross-border change of ownership[16].

Therefore, discrepancies in the b.o.p. goods statistics between countries may originate from two main reasons:

1. differences in the underlying ITGS source data.
2. differences in adjustments to derive b.o.p data from ITGS source data.

[16] For further details between balance of payments and foreign trade statistics see https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Differences_between_balance_of_payments_and_foreign_trade_statistics&oldid=405507

First of all, we compared the methods used to derive b.o.p. goods concepts to adjust ITGS data. While conceptually all countries undergo similar adjustments to derive b.o.p. goods from ITGS data, some estimations need imputations and modelling assumptions to derive these adjustments and, as they may differ across countries, they may contribute to the bilateral discrepancies. It was however challenging to directly map the exact contribution of each adjustment to the existing bilateral asymmetries since some of these adjustments lack the bilateral geographic details needed for our comparison (e.g., illegal trade is estimated by the NSI for the overall goods imports/exports without any bilateral counterparty country detail).

The overall comparison of the bilateral reconciliation tables between ITGS and b.o.p. data, highlighted that asymmetries between our country pairs are usually directly due to differences in ITGS source data. For example, between Italy and Spain, on average, 70% of asymmetries in the b.o.p goods figures are due to the respective differences in the underlying ITGS data, while around 30% is due to differences in the adjustments from ITGS to b.o.p. concepts.

Transport services is another relevant category of asymmetries in the current account among our three countries, with particularly high relevance for Austria. While countries mostly use survey information to estimate these data, differences can derive from using different data sources and/or different adjustments/estimation models across countries. For example, in Italy the item comprises three aggregates computed from three different surveys: (i) the passenger transport services based mainly on the Italian International Tourism survey; (ii) the freight transport (and related auxiliary services) computed from Foreign Trade Statistics and integrated with an ad hoc survey; (iii) the postal services estimated through a quarterly enterprise survey. In Austria, data for transport mainly comes from a dedicated survey to the non-financial sector (by mode of transport), complemented with estimates of the cif/fob correction (distance/freight rate method) and estimates of transport components in travel packages as well as fuel exports according to price differentials with neighbouring countries. In Spain data obtained via surveys are complemented with estimations of the freight services based on prices per kilometre and tonne transported, according to the origin and destination, for different transport modes.

It was generally rather challenging to analyse and pinpoint the exact reasons behind the bilateral differences in the current account items in our exercise, due to different methods of compilation and different ways to perform source data adjustments performed across countries.

3.4.2 Direct investment

An exhaustive analysis of the asymmetries in the FDI category was possible thanks to the availability (and possibility to share) microdata for most of the examined cases. Starting from the asymmetries amounts in the bilateral country comparisons it was possible for the country participants to share in a protected environment the respective microdata information behind each bilateral transaction/position/income flow at the company level. Comparing this very detailed information across countries, it was then easy to pinpoint which company level transactions/positions/income flows were driving the overall bilateral asymmetry amounts. This detailed comparison was realized both for equity and debt instruments in the financial account and income

flows[17]. Additionally, special attention was directed towards reconciling one case of a large divergence in FDI positions between Austria and Italy.

Across the analysed cases, we identified several recurrent factors contributing to the FDI asymmetries among the three country pairs:

- differences in the valuation method used for unlisted equity;
- different classification of dividends (as ordinary or super-dividends);
- transactions recorded differently in the event of large corporate financial restructurings;
- lack of information or inaccuracies in reporting.

First, the topic of **different valuation methods** of unlisted equity as a cause for large bilateral asymmetries in FDI data has been discussed extensively within the statistical community. The international methodological guidance allows several methods as a proxy for market value, e.g., own funds at book value, use of net asset value[18]. Our detailed exercise revealed that large part of the asymmetry in bilateral FDI equity positions between Italy and Austria were due to a different valuation method applied for positions in the banking sector: Italy values its foreign subsidiaries in the banking sector at book value, while the same entities are valued at own funds at book (OFBV) value by Austria. The two different valuation methods provided very different valuation estimates to the same bilateral FDI position. In Italy, for the asset side, data are compiled using integrated reports related to (asset) balance sheet information submitted for supervisory purposes. This analysis shows how it is in practice very difficult/challenging to evaluate positions according to the OFBV for the asset side (i.e., for the values of foreign subsidiaries) since compilers do not have at their disposal detailed information on the books of foreign subsidiaries, unless such information is obtained via a dedicated survey.

Second, also the topic of how the different treatment of distributed earning as **ordinary dividends or super-dividends** can lead to asymmetries has been often discussed in the statistical community. In our detailed investigations, several cases of asymmetries were linked to this issue. For example, there were situations when a company paid a dividend that is related to past years operational income, drawing it from the company's reserve accounts; however, when looking at the history of dividend payments from that company, this looks like its regular behaviour and thus this can be seen as a regular dividend. Following the current international statistical standards, countries may get different interpretations on the definition/practical application of the superdividends concept which can lead to asymmetries between how they records items in the income and the financial account. Furthermore, it is important to highlight that although the identification of superdividends (as opposed to regular dividends) does not affect the net current and net financial accounts (and thus does not impact net errors and omissions), it does change the composition of the subitems (reinvested earnings and equity). This topic is being clarified in the ongoing update of the international statistical manuals and this additional clarity on

[17] Note that the specific issue of trade credits will be addressed in the Other investment category (p 3.4.4).

[18] For additional information on this topic and on the effort to improve cross-country consistency in the ongoing update of the international statistical standards, the interested reader can refer to the IMF Direct Investment task Team (DITT) guidance note D.2 Valuation of Unlisted Equity.

how to record these distributions of funds will help compilers in the future and improve symmetric treatment across countries[19].

Third, change of economic ownership in the **corporate financial restructuring of MNEs** can lead in some cases to different treatments, in particular when these corporate events are complex and involve several operations with different entities in different countries and in different periods. The same cross-border corporate restructuring cases/operations are sometimes identified by country compilers either as "transactions" or as "other changes in volume", depending on their interpretation of the manuals and the (partial) information available at the moment of data compilation.

Finally, there is **lack of information or inaccuracies** in reporting. Although the number of companies and the amount involved were not substantial, these cases may emerge when one reporter did not get any information on a single position/transaction/income flow, or the information received was inaccurate. These cases justified further examination based on the micro-data received from the counterparty country and, in some cases, they were solved after contacting the reporting agent or analysing in detail balance sheet information to find out where the misreporting originated. The most relevant cases were rather concentrated as they regarded two companies between each pair of countries.

We analysed the FDI data mostly based on exchange of microdata for individual transactions and positions. For each of the four macro reasons illustrated above, we found out that asymmetries are concentrated in a small number of cases, linked to the operations of a small group of large enterprises. Often a single enterprise is responsible for the great majority of the asymmetry, with the asymmetric recording even affecting different items (e.g., equity transactions and income recording). For example, for several FDI bilateral asymmetries, one single case/company was responsible between 70% and 90% of the bilateral asymmetry. This finding shows how the phenomenon of FDI is very concentrated and obtained symmetric recording of a small number of large cases would significatively improve bilateral consistency in data across countries.

3.4.3 Other investment

The bilateral discrepancies in deposits and loans were mainly due to differences in benchmarking to other datasets. By comparing the two datasets directly, we were able to identify and reconcile discrepancies in loans.

Concerning the reporting gap of deposits and loans of foreign banks[20] from/to domestic private households, non-financial corporations as well as other financial institutions, different compilation methods/data sources are applied:

- Austria uses the mirror data of BSI statistics for the euro area as well as the BIS locational banking statistics[21] to close the reporting gaps;

[19] For additional information on this topic, the interested reader can refer to the IMF Direct Investment task Team (DITT) guidance note D.17 Identifying Superdividends and Establishing the Borderline Between Dividends and Withdrawal of Equity in the context of Direct Investment

[20] Monetary Financial Institutions

[21] Locational banking statistics (bis.org)

- Spain adjusts the data only for private households;
- Italy does not use BSI and BIS locational banking statistics for compilation purposes.

During the trilateral exercise, the international AnaCredit database was also used for the in-depth analysis of loans by foreign banks to resident corporations. For example, an analysis of the top five loans from Austrian banks to Italian or Spanish nonfinancial cooperations was helpful to identify missing data reporting from the Italian or Spanish nonfinancial corporations.

Discrepancies in loans and deposits in some cases compensate, suggesting a misclassification in one of the counterparties. One possibility comes from an issue related to compilation method: in Italy, deposits of deposit-taking corporations vis-à-vis a non-deposit-taking corporations are not reclassified as loans, as suggested by the international statistical manuals, and are classified as deposits. This led to the result that in the bilateral data, especially between Italy and Spain, compensating discrepancies in loans and deposits in sum were showing.

The asymmetries in insurance, pension schemes, and standardised guarantee schemes were due to national differences in sources. The highest discrepancies were between Italy and Austria as well as Italy and Spain. While Austria mainly uses information from financial market authority and Solvency II data, Italy bases the compilation on direct reporting and tax information. Spain uses insurance corporation and pension fund statistics, tax information, as well as information from the Spanish financial regulatory department.

For trade credits, the main reason for asymmetries is a methodological deviation in Spain. Italy and Austria use a direct reporting system, but cross-border trade credits and advances in Spain are classified in the functional category of other investment only. This means there are no trade credits and advances recorded in FDI for Spain[22], which resulted in a relatively high asymmetry between Spain and Italy. At the same time, only small asymmetries were detected between Austria and Italy and Austria and Spain. In order to further investigate asymmetries between Spain and Italy, a micro data analysis was performed. In this case, differently from what emerged in the FDI, flows data were not concentrated in a small number of enterprises but they are spread on a quite large number of medium sized operations. Moreover, it sheds in light another possible methodological source of asymmetries: data coming from surveys are grossed up and even if the micro data are equal the grossing up procedure can led to different total amounts.

3.4.4 Portfolio investment

In the absence of reliable data on the residency of non-resident holders of portfolio liabilities, the holdings of domestic securities by non-residents are often estimated using a "residual approach". This method involves subtracting the total holdings of domestic securities by resident investors from the total amount of domestic securities outstanding, and assuming that the remaining amount is held by non-resident

[22] In the benchmark revision 2024 Spain will begin to differentiate trade credits and advances from direct investment from those of other investment.

investors. However, this approach results in missing information on the geographical breakdown of liabilities[23].

Austria has implemented an estimation on an annual basis based on mirror data from Securities Holding Statistics by Sector (SHSS) and the Coordinated Portfolio Investment Survey (CPIS) to analyse the geographical breakdown. The quality of country-specific results depends on the outcome of the residual approach as well as the quality of mirror data in the SHSS and the CPIS. The incomplete reporting of assets in the CPIS, due to non-reporting countries and hidden wealth[24], results in Austrian PI liabilities exceeding foreign assets held by Austrian investors.

In our exercise, the geographical breakdown of Austrian PI liabilities stocks was compared to the Spanish and the Italian assets, resulting in only minor bilateral asymmetries. This exercise showed that using SHSS and CPIS for the geographical breakdown of the i.i.p. may be a good source, at least within the Euro Area.

3.4.5 Summary table on expected reconciliation results

Based on the findings of our analyses, the main expected reconciliations are in FDI and mainly linked to the described topics of market valuation, dividends vs. super dividends, and corporate financial restructuring (section 3.4.3.). The key finding that only a small number of large MNEs dominate the discrepancies in FDI calls for a particular care and attention to the correct recording of the cross-border operations on MNEs. The current update of the international statistical manuals provides a very valuable opportunity to help compilers to narrow down the cases where different interpretations of the guidance is possible and to increase the focus on providing additional clarity on how to treat complex cross-border economic phenomena.

Other investment (OI) also showed potential reconciliations results, but mainly based on missing reporting, which were uncovered by using granular information from AnaCredit information. Another expected reconciliation result will come from the resolution of the methodological deviation in Spain concerning trade credits. In some cases, additional reporting mistakes or missing information were discovered across the three countries, though they had a relatively small impact on the observed asymmetries.

Overall, there are no expected reconciliations results for portfolio investment as it was a unilateral exercise by Austria and in goods and transport services, due to asymmetries mostly due to source ITGS data and different methods used in the compilation, respectively.

[23] Detailed information on the estimates of the geographical allocation of portfolio investment liabilities can be found in the EU b.o.p./i.i.p. e-book and, for the estimates on the geographical breakdown of euro area portfolio liabilities in the document https://www.ecb.europa.eu/pub/pdf/other/Geographical_allocation_of_euro_area_portfolio_investment_income_debits-methodological_note-201904~617d8ce92c.en.pdf

[24] Schmitz, Martin, "An assessment of euro area households' missing foreign assets," in Bank for International Settlements, ed., New developments in central bank statistics around the world, Vol. 55 of IFC Bulletins chapters, Bank for International Settlements, 2021.

	Direct Investment	Other Investment
Short-term reconciliation	Correction of wrong reporting	Correction of wrong reporting
Medium-term reconciliation (benchmark revision/ revision of international manuals)	Differentiation in trade credits and advances data	Use of mirror data
Long-term reconciliation (international guidance needed)	Dividends vs superdividends Corporate financial restructuring	

4. Suggested initiatives for improving quality of bilateral data

The trilateral exercise revealed several opportunities to further reduce the differences observed in the bilateral flows and positions between countries. Indeed, we noticed that with a few very target initiatives we can get considerable reconciliation results that improve the data quality of b.o.p./i.i.p.. The two initiatives described in the next subsections are presented by effort required to the compilers of b.o.p./i.i.p..

4.1 ESCB data sharing of bilateral data

The ECB has been collecting bilateral flows and positions between EU countries, the so-called the intra-EU flows and positions, for several years. The main purpose is to improve the euro area aggregates, as intra euro area flows and positions need to be excluded for the euro area when considered as one economic territory area, and to assist in the event euro area enlargement.

The bilateral data are transmitted to the ECB and are kept in the ECB systems. The sharing of the bilateral data with euro area statistical authorities has been considered in the past but has never happened in a systematic manner. The trilateral exercise made particular use of the bilateral data available in the ECB systems and securely shared the data with participating countries.

The sharing of the bilateral flows and positions between the euro area countries has the potential to regularly inform each euro area country on how their data sources and methods compare with the mirror data from partner euro area countries. The information can be used in many ways:

- Ad-hoc reconciliation of a single but large difference. The reconciliation can anticipate future revisions and promote better internal consistency of the accounts in b.o.p./i.i.p.. In fact, it is possible that a country may miss information while its partner country already collected the data. This is related to the different frequency of the data sources across countries.

- Multi-partner bilateral analysis (asymmetries indicators) for a given item to help in calibrating data sources and/or compilation methods. This is particularly

relevant if a country shows systematic bias, all in the same pattern, with various partner countries simultaneously. The study will help in detailing the root causes and devise actions to correct the situation.

ECB and national compilers agreed to share the bilateral data at the end of the quarterly compilation rounds.

4.2 Structural reconciliations for large MNEs

B.o.p./i.i.p. are highly influenced by the global role of large MNEs. The organisation of global value chains[25] by MNEs have grown in complexity and involve many countries. Also, the distribution channels of the goods and services offered by MNEs are often set up to serve consumers globally. Such a complexity and intensity of trade in goods and services, intellectual property rights, as well financial flows both intra and extra MNEs is observable practically in all b.o.p./i.i.p. items.

Such dominance of MNEs in b.o.p./i.i.p. is also evident in the asymmetries between country bilateral data, which is confirmed by the results of the matching study of this paper.[26] In fact, very few MNEs accounted for most of the relevant differences in the matching study. The main reasons for the differences are:

- Change of economic ownership: transactions are recorded when there is a change of the economic ownership, as a rule in b.o.p./i.i.p.. This principle is particularly challenging to apply in MNEs and their complex global value chains. Differences in bilateral country data can arise for instance by one MNE affiliate reporting a change of ownership for some intermediate goods, while the next MNE affiliate in another country does not.

- Valuation of intra-group transactions and positions: MNE units may report different values of the same intra-group trade recorded in goods and services and of the same intra-group financials recorded in FDI to their respective resident statistical authority. In the matching study the valuation of FDI equity positions showed a large bilateral difference related to the selection of the valuation method for unlisted equity used by the units (see section 3.4.2).

- Generation and distribution on income along the chain of control: MNEs have a great control to shift profits from one location to the other. This means that the generation of income can quickly change from one reference period to the other, sometimes using temporary SPEs. In addition, the distribution of income can create classification difficulties linked to the consistent application of definitions across countries and respondents, most evidenced in the matching study by the application of the ordinary versus super dividends definition.

[25] Global value chains include sequential value-added functions such as design, production, marketing, transportation, logistics, distribution, support and after-sales service to final consumers. All these activities can happen in any location around the globe and not exclusively in one unit and country. For more information see Global value chains and economic globalization, Report to Eurostat by Timothy J. Sturgeon, 2013 and Lane, P.R., "The analytical contribution of external statistics: addressing the challenges", keynote speech at the Joint European Central Bank, Irving Fisher Committee and Banco de Portugal conference on "Bridging measurement challenges and analytical needs of external statistics: evolution or revolution?", 17 February 2020.

[26] Inconsistencies may also arise in the reporting of MNEs to other statistical domains than external statistics.

4. Conclusions

Our paper presents a novel approach to identifying and addressing asymmetries in b.o.p. and i.i.p. statistics. By leveraging a trilateral comparison framework, we were able to detect systematic patterns that indicate inconsistencies in the data and prioritize the analysis and reconciliation of specific breakdowns that contribute most to the overall bilateral asymmetries between countries.

Our pilot project involving the comparison of b.o.p./i.i.p. data of Austria, Italy, and Spain demonstrated the effectiveness of our framework in identifying and reconciling bilateral asymmetries. The main reasons behind asymmetries related to the interpretation of statistical concepts, data collection sources, and statistical estimation methods. By sharing microdata in a safe and protected fashion, we were able to solve the majority of bilateral asymmetries in b.o.p./i.i.p. data. We contributed to improve the accuracy and reliability of these statistics for the benefit of policymakers, economic analysts, and the public to make better-informed decisions based on high-quality international economic data.

Our project highlights the importance of international cooperation and coordination in improving the quality of b.o.p./i.i.p. statistics. The trilateral setting of our exercise allowed for in-depth comparisons between country pairs that are rarely involved in exchanges in existing European initiatives on asymmetries, and the sharing of microdata enabled the identification of systematic patterns that indicate inconsistencies in the data.

Our framework has the potential to be applied to other countries and regions, and we encourage policymakers and statistical agencies to adopt this approach to improve the accuracy and reliability of their b.o.p./i.i.p. statistics. By working together, we can enhance the quality of international economic statistics and support more informed decision-making in the global economy.

Future work may revolve around implementing and refining the ESCB data sharing of bilateral data and structural reconciliations for large MNEs, with a focus on monitoring their effectiveness in mitigating differences in bilateral data. Furthermore, additional research may investigate the development and application of sophisticated algorithms that can assist in the statistical intricacies of MNEs' global value chains. For example, future exercises could involve several countries collaborating on reconciliation efforts, with a focus on specific MNEs, to provide comprehensive insights and promote better internal consistency of the b.o.p./i.i.p..

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Improving the quality of balance of payments statistics via granular bilateral analysis

Trilateral comparison: Austria, Italy and Spain

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12th IFC Biennial Conference "Statistics and beyond: new data for decision making in central banks"
(Basel, 22-23 August 2024)

Motivation

- Balance of payments and international investment position (also known as External sector statistics) **measure the economic and financial linkages between economies**
- **High quality statistics** is key to ensure adequate and reliable data feeds into policy making (monetary and fiscal, macro-imbalances procedure)
- Statistical authorities collect data independently from each other and from their resident units – **bilateral asymmetries** may occur
- Presence of bilateral asymmetries **undermine the credibility and usage of External sector statistics**
- Sizable bilateral asymmetries have been a growing concern (increased **complexity of global economic relations** have difficulted the measurement process for External sector statistics)

Trilateral comparison of asymmetries

Austria, Italy and Spain showed interest to improve their external sector statistics

- 3 years of data (2019, 2020, 2021) as of Oct.22 data vintage

Trilateral framework for in-depth comparison and reconciliation

- Trilateral setting better to detect systematic patterns on bilateral data
- Devise practical setup to organise the comparison including safe sharing of microdata

Framework and results

Qualitative analysis on statistical methodology, methods and reporting systems

Quantitative data comparison and prioritisation strategy

Investigation of granular asymmetries and addressing reconciliation efforts

Qualitative analysis

Understand possible structural causes of bilateral asymmetries

- deviations from BPM6 methodology
- different data collection processes
- different compilation methods
- the institutional responsibility (NCB, NSI)

Example of country overview table for qualitative analysis

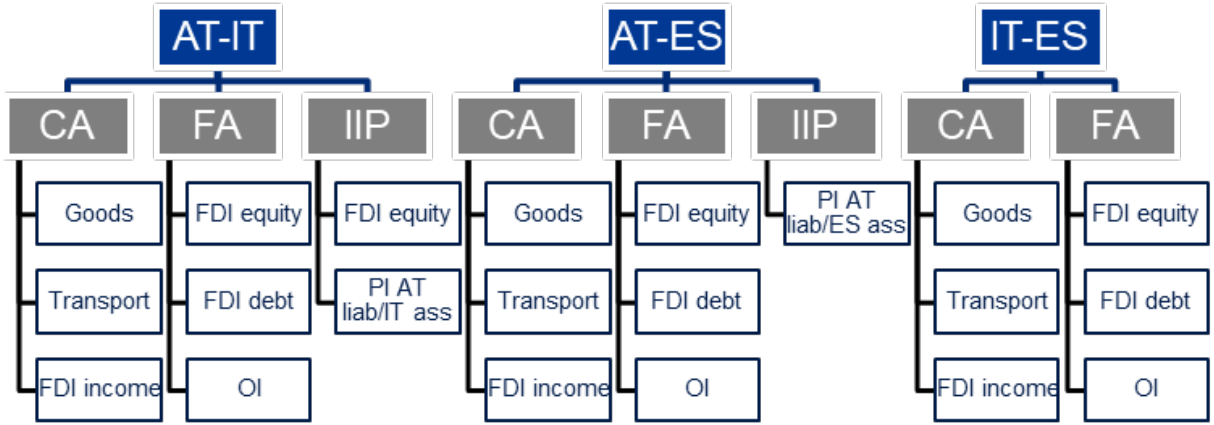
	Methodology	Data collection				Compilation methods				Responsible institution
	Deviations	Administrative data	Direct reporting	Survey	Other	Adjustments to data sources	Statistical model based on indicators	Other estimations	Benchmarking to other datasets	NCB/NSI
FDI equity										

Methodology mostly aligned, with the main deviations detected:

- Italy: no reclassification on the asset side in loans for MFIs is made
- Spain: trade credits and advances registered only in other investment (no recording in FDI)

Quantitative data comparison

- Tables with asymmetries by pair of countries, category and period
- Synthetic relevance asymmetry indicator (RELV*) of each category asymmetry in the overall asymmetries vis-à-vis the group of counterparties in the trilateral exercise
- Gravity model to add additional benchmark information about each category and country



Investigation of granular asymmetries

Goods

- Similar data sources (ITGS)
- Estimations to adjustment for BPS
- E.g. IT-ES bilateral asymmetries 70% due to differences in data source and 30% due to differences in adjustments
- Challenging to directly map the exact bilateral asymmetry as some adjustments are made without a detailed geographical allocation (e.g. illegal trade estimates)

Other investment

- Bilateral discrepancies in **deposits and loans** were mainly due to differences in different compilation methods/data sources (BSI statistics, BIS locational banking statistics). Anacredit database used for checking loan data by foreign banks to resident corporations.
- Asymmetries in **insurance, pension schemes, and standardised guarantee schemes** were due to national differences in sources (Solvency II data, surveys, tax information).
- Flows data on **trade credits** are spread on a quite large number of medium sized operations (difficult to make a micro data analysis); possible methodological source of asymmetries due to grossing up procedure.

Investigation of granular asymmetries

FDI	IT – ES			IT – AT			AT – ES		
Reason	Item	Number of enterprises	Weight on asymmetry*	Item	Number of enterprises	Weight on asymmetry*	Item	Number of enterprises	Weight on asymmetry*
Mistakes or missing information	Equity	1	80%	Debt Equity	1 1	100% 75%	Equity	2	80%
Valuation				Flow Stock	1 1	100% 100%			
Dividends	-	1	100%	-	1	100%			
MNE financial restructure	Equity	1	100%	Equity	1	75%	Equity	1	Pending of deeper analysis
Special case of trade credits									

**on average over the periods involved*

Conclusions and suggested initiatives

Conclusions

- Useful exercise to challenge status quo and encourage revising data reporting/compilation methods
- When available, exchange on micro level data is key – confidential treatment of data to be ensured
- Sometimes discrepancies due to reporting mistakes, sometimes there is an explanation
- International discussions/operational agreements are needed to overcome causes for major discrepancies (FDI equity valuation, super-dividends, corporate restructuring)
- For smaller countries in-depth analysis on a bilateral basis is very useful
- A small number of MNEs (2 to 3 per country pair) responsible for most of the discrepancies
- Corrections of data not always immediately possible (super-dividends, MNEs restructuring)

Suggested initiatives

EU bilateral data sharing
- Ensuring confidential treatment of data
- Allowing countries to access counterparties' bilateral data
- Provide a feedback system (ECB Quarterly Asymmetries Reports)

Structural reconciliation exercises for large MNEs
- To understand the different information basis
- Integration with European business registers and existing networks
- Few units with large impact

Organise further trilateral exercises

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Thank you for your attention!

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