

Asymmetries in official international trade statistics and analysis of globalization

Discussion paper

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Foreword

This paper is not intended as a comprehensive description and discussion of all issues related to asymmetries in international trade data and their consequences for the analysis of globalization. It focuses only of some of them – those which, in my view, have to be highlighted in the context of recent work on measuring trade in terms of value added and building global input-output tables. The paper consists of three parts: Part I - Setting the stage, Part II - Trade data asymmetries and building global input-output tables and Part III - Way forward: some conclusions/points for discussion.

I Setting the stage

A. Decisions of the UN Statistical Commission and scope the discussion paper

1. At its 44th session (2013) the United Nations Statistical Commission (the Commission) recognized “the need for an overarching measurement framework for international trade and economic globalization”² and at its 45th session (2014) the Commission appreciated the report on the measurement of international trade and economic globalization and, *inter alia*, “reiterated the importance of obtaining more clarity in the complex measurement issues of cross-border economic relations”, requested to pay special attention to a number of issues including “discrepancies in mirror statistics”, “the data sources for global input-output tables” and specifically requested “to do a cost-benefit analysis of any recommendation requiring additional data sources, especially additional surveys, and thus creating an additional burden to respondents”³.
2. Following the Commission’s decision a report was delivered by the UN Secretary-General (E/CN.3/2014/7) entitled *Measurement of international trade and economic globalization*, which described the work done in this area since its 44th session. That report stated, in particular, that measuring trade in terms of value added on the basis of official data requires the availability of national supply-use tables and national input-output tables and that, in order to construct an inter-country input-output model, data from different countries must be harmonized. The report acknowledged that this is a complex process and one of the main tasks is the reconciliation of differences in bilateral trade data for both goods and services⁴.
3. This discussion paper will focus on selected conceptual and practical issues relevant to understanding the asymmetries in international trade statistics and the possible ways to deal with them in

² See the report of the 44th session on the UNSC (decision 44/106); available at: <http://unstats.un.org/unsd/statcom/sc2013.htm>

³ See the report of the 44th session of the Commission (decision 45/106); available at: <http://unstats.un.org/unsd/statcom/doc14/2014-Report-E.pdf>

⁴ *Measurement of international trade and economic globalization*, Note by the Secretary-General to the 45th session of the UN Statistical Commission, E/CN.3/2014/7, paragraph 6

the context of measuring trade in terms of value added and building global input-output tables. It is not intended as a comprehensive description and analysis of all issues relevant in this context. It contains several highlights and is, as its title suggests, an invitation to discussion in the spirit of finding the best practical ways of dealing with the demands for an improved data on globalization.

4. The issues to be discussed are not new and were deliberated many times by trade statisticians in various bilateral, regional and international forums⁵. Asymmetries in official international trade statistics are well known to data analysts who proposed several ways how to deal with them while developing new indicators of globalization. Trade data are widely used by politicians and general public as well. In this connection some concerns on the use (or misuse) of official international trade statistics also need to be addressed.

B. Measuring international trade in terms of value added and official international trade statistics

5. In recent years a search for improved indicators of globalization has intensified. Two important contributions were provided by OECD/WTO and European Commission. The OECD/WTO approach is described in a joint note by OECD-WTO *Trade in value-added: concepts, methodologies and challenges*⁶. European Commission sponsored a project aiming at building world input-output table which is elaborated a working paper entitled *The World Input-Output Database (WIOD): Contents, Sources and Methods, Working Paper Number 10*⁷. Both projects benefited from the work done earlier by many analysts⁸.

6. A joint note by OECD-WTO *Trade in value-added: concepts, methodologies and challenges* expressed “a growing awareness that conventional trade statistics may give a misleading perspective of the importance of trade to economic growth and income” as the “trade flows are measured in this statistics gross and that the value of products that cross borders several times for further processing are counted multiple times” and proposes that “better metrics to measure the contribution of trade to nations’ value-added, income and employment” are developed⁹. The note acknowledges that “Gross recording of

⁵ See, for example, *International Merchandise Trade Statistics: Compilers Manual*, UN, 2014, chapter 13

⁶ *Trade In Value-Added: Concepts, Methodologies and Challenges*, (Joint OECD-WTO NOTE); available at: <http://www.oecd.org/sti/ind/49894138.pdf>;

⁷ *The World Input-Output Database (WIOD): Contents, Sources and Methods, Working Paper Number 10* (April 2012), deeded by Marcel Timmer.

⁸ Examples of this work are: *Towards Harmonised Bilateral Trade Data for Inter-Country Input-Output Analyses: Statistical Issues* by Dong Guo, Colin Webb and Nori Yamano (2009); *Reconciling Bilateral Trade Statistics in the Presence of Re-exports via Third Countries: The Case of China, Hong Kong and Their Major Trading Partners* by Zhi Wang, Mark Gehlhar and Shunli Yao (2009); *How a Global Inter-Country Input-Output Table with Processing Trade Account can be constructed from GTAP Database* by Marinou Tsigas, Zhi Wang and Mark Gehlhar (202); *Introduction to the Global Trade Analysis Project and the GTAP Data Base* by Terrie Walmsley, Angel Aguiar and Badri Narayanan; *BACI: International Trade Database at the Product-level: the 1994-2007 Version* by Guillaume Gaulier and Soledad Zignago (2010).

⁹ *Trade In Value-Added: Concepts, Methodologies and Challenges*, (Joint OECD-WTO NOTE); available at: <http://www.oecd.org/sti/ind/49894138.pdf>; Here I would like to add few words of caution on the terminology. In my view, the term “trade in value added” may be misinterpreted by some users as one is yet to see any actual

trade flows is not an issue by itself; as a matter of fact, they are essential when the focus is on the (increasing) interconnectedness of economies or the study of supply-chains, and global production networks” but, as stated in the note, these statistics “can be misleading, as is often the case, when one crudely relates gross flows of exports, say, with domestic value-added and national income, or its components such as profits or wages, and by extension, employment”¹⁰. This is a very valid point as trade statistics, if misunderstood, will be misused. The blame should be not only on those users who jump to the conclusions before making sufficient effort to understand the nature of the data, but on the producers of official trade statistics as well who, apparently, do not do enough to explain the meaning of the data, their advantages as well as their limitations.

7. The OECD-WTO estimates of international trade in terms of value added are based at moment on the global IOT database covering 57 economies and 48 groups on economic activities (industries)¹¹. This is a very significant and commendable achievement, the one which will really help to understand globalization of the production processes and the role of international trade in valued added creation. However, there are significant limitations to this “new trade statistics” - both conceptual and practical.

8. Firstly, global input-output table will remain, even in the long term, the tool to generate estimates of valued added attributed to traded outputs of highly aggregated industry groups (for reference - there are 419 classes of activities (4-digit codes) in ISIC, Rev 4¹²). This is recognized in the note: “In practice of course we will never have the level of detail needed to conduct a value-added decomposition for all individual products in the way theorised above, so it will be necessary to use aggregated data.”¹³ This is important to underscore – the measures of trade in value added terms are being developed for a very high level aggregates and, in my view, will not be available at the level of detail provided in current official trade statistics (for example, at the level of 6-digit codes of the HS) due to a number of conceptual and practical reasons. The WIOD estimates have the same kind of limitation.

9. Secondly, building any national IOT, and even more so, building global IOT requires application of many very simplifying assumptions (the proportionality assumption is just one example). The impact of such assumptions on the quality of the resulting estimates has to be assessed to assure users that the derived indicators meet expected quality standards. It should be noted that the WIOD approach differs from the standard proportionality method as it was found that import proportions differ widely across use categories and importantly, within each use category they differ also by country of origin.¹⁴

10. Other challenge described by developers of global IOT is that “the breakdown of the use table into domestic and imported origin is a crucial step, but empirically hard to make. Ideally one would like

sales contract written in terms of value added. I would advise to stay with the term “trade measured in terms of value added” (still can be abbreviated as TIVA). If the term “trade in value-added” makes its way into official documentation it should be followed by some kind of disclaimer/clarification saying that it is used in a kind of metaphorical sense.

¹⁰ *Trade In Value-Added: Concepts, Methodologies and Challenges*, (Joint OECD-WTO NOTE), para 2

¹¹ *Trade in Value Added, Jobs and Investment* by Nadim Ahmad (OECD) and Jennifer Ribarsky (OECD), a paper prepared for the IARIW 33rd General Conference, Rotterdam, the Netherlands, August 24-30, 2014, pages 15-16

¹² ISIC, Rev. 4. paragraph 53.

¹³ *Trade In Value-Added: Concepts, Methodologies and Challenges* (Joint OECD-WTO NOTE), Para 20

¹⁴ WIOD (2012) Working paper, page 9.

to have additional information based on firm surveys that inventory the origin of products used, but this type of information is hard to elicit and only rarely available.”¹⁵ Yes, it is possible, at least in the medium term, for countries to do more in this field by capitalizing on microdata and links between trade and business registers. This, however, should be systematically promoted and supported by statistical capacity building, especially in developing countries. Also, replacing or supplementing customs-based trade data with survey data will always be expensive and problematic¹⁶.

II Trade data asymmetries and building global input-output tables

11. Three main and well-known reasons for asymmetries in bilateral merchandise trade are (i) the application of different criteria of partner attribution in import and export statistics, (ii) the use of CIF-type values in import statistics and FOB-type values in export statistics, and (iii) application of different trade systems in data compilation. There are other reasons why official trade statistics of trading partners does not match but they are not discussed in this paper.

A. Asymmetry due to differences in partner country attribution

i. Currently recommended partner attribution

12. *International Merchandise Trade Statistics: Concepts and Definitions 2010 (IMTS 2010)* was adopted by the UN Statistical Commission in 2010 and contains following recommendations regarding partner attribution: (a) in the case of imports, the country of origin should be recorded; (b) in the case of exports, the country of last known destination should be recorded. IMTS 2010 clearly states that such partner attribution is not ideal¹⁷. It explicitly warns that there are limitations to the use of data compiled on a country-of origin basis; most notably, such an approach does not permit a symmetrical recording of the same trade transactions by the exporting country and the importing country and that this creates incomparability and detracts from the usefulness of such trade data for some types of economic analysis¹⁸.

13. The awareness of this limitation led the IMTS Expert Group to propose that country of consignment be also included in IMTS 2010 as a possible partner attribution. Indeed, IMTS 2010 states that “in view of the needs for internationally comparable partner data for analytical purposes as well as for trade data reconciliation studies, it is recommended that country of consignment be recorded for imports as the second partner country attribution, alongside country of origin”. In the case of exports the

¹⁵ WIOD (2012) Working paper, page 7

¹⁶ See, for example, *Quality Report on International Trade Statistics*, Eurostat, 2010, page 28; available at: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-RA-10-026/EN/KS-RA-10-026-EN.PDF

¹⁷ *International Merchandise Trade Statistics: Concepts and Definitions 2010 (IMTS 2010)*, , para 6.25; available at: [http://unstats.un.org/unsd/trade/eg-imts/IMTS%202010%20\(English\).pdf](http://unstats.un.org/unsd/trade/eg-imts/IMTS%202010%20(English).pdf)

¹⁸ IMTS 2010, para 6.22

compilation of data on the country of consignment basis is only encouraged, depending on a country's needs and circumstances¹⁹.

14. It is important to stress this point – country of consignment is already recommended as the second partner attribution for import statistics and encouraged for export statistics. If country compilers would have implemented this, trade data compiled on the country of consignment basis should have shown a decrease in observed asymmetries (at least this is what we hope for). In addition, this way of partner attribution should increase the number of recorded bilateral trade transactions in the supply chain as countries are supposed to report any transaction which changes the legal status of the goods as they move from country to country.

15. From the point of view of measuring international trade in terms of value-added, the recording by country of consignment should probably be preferred over country of origin/ final destination, since even low value added attributable to the goods in each country might (at least conceptually) be captured in this case. In other words, the current identification of the trading partner (for imports) by country of origin skips countries in which value added does not reach the level recognized as substantial transformation (when valued added is used as the criterion defining such a transformation) while recording on the country of consignment basis has such a potential. In view of some lingering misunderstanding regarding the concept of country of origin few clarifications might be useful.

ii. Imports statistics and the concept of “country of origin”

16. The international guidance on the rules of origin is currently provided by the Revised Kyoto Convention²⁰ which specifically states that “country of origin of goods means the country in which the goods have been produced or manufactured, according to the criteria laid down for the purposes of application of the Customs tariff, of quantitative restrictions or of any other measure related to trade”. The convention promotes two basic criteria for the determination of origin: (a) the criterion of goods “wholly produced (obtained)” in a given country, where only one country enters into consideration in attributing origin and (b) the criterion of “substantial transformation”. Both concepts “wholly produced (obtained)” and “substantial transformation” have specific meaning which is not exactly the same how “production” or “substantial transformation” might be understood in economic statistics.

17. The Kyoto convention promotes change in HS codes and ad valorem rules but leaves the detailed definition of the rules of origin to countries. Therefore, correct interpretation of import data by country of origin requires knowledge of the specific rules of origin adopted in any given country. In summary - country of origin is a customs concept which can be taken only as a proxy of the country where the last stage of good production cycle (as defined by the change in the HS codes or by “substantial transformation”) was taking place prior to their entering customs territory of the importing country; even

¹⁹ IMTS 2010, para 6.26

²⁰ Available at: http://www.wcoomd.org/en/topics/facilitation/instrument-and-tools/conventions/pf_revised_kyoto_conv.aspx

goods “wholly produced” in a country may be produced with various imported inputs and, therefore, that country cannot be always treated as the only country involved in their production.²¹

18. Regarding trade policy relevance of rules of origin it should be noted that these rules are still very much in the center of trade negotiations. The WTO Committee on Rules of Origin is still functioning and has on its table a draft harmonized non-preferential rules of origin even though the views of its members are fundamentally divided. Several countries (e.g., Canada, Australia and the United States) believe that adopting harmonized rules of origin would no longer help facilitate trade, which had changed substantially since the start of the negotiations, while other (e.g., the European Union, China, India) state that the globalization of manufacturing operations have made it more important to complete the harmonization work as exporters were being confronted with uncertainty created by labelling obligations due to different national rules of origin. At its latest meeting (10 April 2014) the chair of the Committee “reported on his consultations with delegations on a possible way forward for the Committee’s harmonization work programme on non-preferential rules of origin” while the WTO Secretariat made a presentation on the transposition of the draft rules of origin into more recent versions of the Harmonized System (HS) nomenclature²².

iii. Country of consignment as a way to obtain more symmetrical trade data

19. First a few definitions. The country of consignment in the case of imports is the country from which goods were dispatched to the importing country, without any commercial transactions or other operations that change the legal status of the goods taking place in any intermediate country. If, before arriving in the importing country, goods enter one or more further countries and are subject to such transactions or operations, that last intermediate country where such transactions or operations took place should be taken as the country of consignment. In the case of exports the country of consignment is defined in a symmetrical way: it is the country to which goods are dispatched by the exporting country, without—as far as it is known at the time of exportation—being subject to any commercial transactions or other operations that change the legal status of the goods taking place in any intermediate country. If there are several intermediate countries, then the first intermediate country after leaving the exporting country should be recorded as country of consignment or destination²³.

20. Conceptually, compiling trade data by the country of consignment offers the possibility of obtaining consistent statistics and reasonable comparability since it promotes the recording of the same transactions by importing and exporting countries. This approach should result in more symmetrical data since goods recorded as imports by one country are to be recorded as exports by another. This, however, implies that the documentation defining the consignment agreement is available and used by trade data compilers of both countries. However, customs are focused on the documentation related to customs matters (customs value, origin of goods, goods specifications for environmental, health etc. reasons) and might not be a good source of administrative data regarding the country of consignment. It is also not

²¹ “For the purpose of determining the origin of goods, no account shall be taken of the origin of the energy, plant, machinery and tools used in the manufacturing or processing of the goods.” Revised Kyoto Convention, Annex K, Standard 11

²² See: http://www.wto.org/english/news_e/news14_e/roi_10apr14_e.htm

²³ See: IMTS 2010, para. 6.4

clear yet whether enterprise surveys of international trade will result in availability of good quality import/export data by country of consignment. Clarification of this matter should be high on the agenda for future work aiming at improving international trade statistics.

21. It should be stressed that attribution of imports to the country of consignment creates a set of trade statistics with different economic meaning. For example, if the US would record imports on the country of consignment basis then all goods which were shipped from China to HK and changed their legal status there (e.g., sold to HK resident but consigned afterwards from HK to the US) would be recorded by the US as imports from HK while their origin will be still attributed to China. The US trade balance with China, as seen through so redefined US import statistics, would be greatly improved (but worsened with HK).

22. Unfortunately, in practice, data symmetry is not guaranteed: for example, if goods are consigned from county A to country B then county A will record exports to B. If still being in international transportation goods are sold to country C, consigned to it and arrive in C, import of goods will be recorded by C from A (not from B). Export statistics of country A will still have an entry of exports to B as export statistics “are rarely revised to reflect the change in country of consignment”²⁴. Trade statistics of B will not have records of this consignment. So, additional checks and reviews may be necessary by the compiling agency to apply correct assignment of country of consignment.

23. On another note – consignment is the delivery of goods from the consignor to the consignee under the agreement that the consignee sells the goods for the account of the consignor. The consignor may not be the owner of the goods and both consignor and consignee may not necessarily be residents of the country from which goods are shipped or to which they are to be delivered, so that the degree of the approximation of the change of ownership achieved by the use of the country of consignment also has to be further investigated and assessed on the basis of facts.

24. In view of the above what might be a practical option for reflection of bilateral trade in global IOT? I think that:

- i. Country of consignment seems to be conceptually a better option as the ultimate objective of measuring trade in terms of value-added is to estimate the contributions of all trading partners in the global value chains. This includes not only the contributions of the countries which were identified by the application of the rules of origin, but also the contributions of the countries where goods do not change the origin and yet where the increase in value added does happen. For instance, even though traders in Hong Kong may contribute relatively low value added to the goods originating in China for a complete analysis of the production chain an estimation of this value added would be necessary and this could be obtained through the recording of international trade on the basis of country of consignment.
- ii. In the absence of bilateral trade statistics on the basis of the country of consignment, an alternative would be to (i) continue to use national import statistics by the country of origin as

²⁴ IMTS 2010, para 6.19

the basis for reflection of imports in supply table (with the use CIF/FOB adjustment as applicable) and for filling in the intermediate consumption block of use table (converted to applicable industry/product aggregates) and (ii) keep official total exports (with adjustments adopted by NA compilers) but show exports structure using partner import data (not country's export statistics)²⁵. This is an approach adopted by WIOD: "To ensure consistency between bilateral flows of imports and exports, exports are defined as mirror flows from imports. More specifically, imports of product *i* of say country A from country B are assumed to be equal to the exports of this product from B to A."²⁶ This approach, in a way, resembles what some countries do with their national trade statistics. For example, as an outcome of bilateral reconciliation studies between the United States and Canada, both countries agreed to derive their exports statistics from the partner country's statistics on imports. The agreement is implemented since 1990, and both countries consequently eliminated the requirements for filing export documents for goods destined to the other. Under the agreement to exchange data, the reporting burden on exporters is greatly reduced and data quality is improved²⁷.

B. Asymmetry due to differences in statistical valuation

25. As most countries apply a CIF-type valuation of imports and a FOB-type valuation of exports certain CIF/FOB adjustments of imports are usually incorporated in supply and use tables including in symmetrical input-output tables. At the moment focusing on the ways how to improve such adjustments and to make them more comparable internationally is, in my view, the most practical way to deal with the asymmetries caused by differences in valuation. In this connection further effort to document in more detail all existing experiences is needed in order to identify the best practices in this area of work.

26. In this connection it should be pointed out that IMTS 2010, while reconfirming the recommendation to compile import statistics on CIF-type value basis, encourages countries "to compile FOB-type value of imported goods as supplementary information" and/or "to compile separate data for freight and insurance, at the most detailed commodity and partner level possible."²⁸

27. In general, the compilation of imports value on a FOB-type basis ideally should be done by collecting information on freight and insurance at the transaction level. However, this is, for majority of countries, not feasible in practice. Therefore, two more practical ways of compilation of imports value on a FOB-type basis can be considered, namely:

- i. By collecting freight and insurance information at the shipment level (such data are more easily available from customs), and then breaking it down to the commodity by partner level

²⁵ It should be emphasized, however, that this approach will lead, in some cases, to serious discrepancies between international estimates of bilateral trade used in global IOT and national data on exports and production. It follows that a set of rules on when partner import statistics cannot be used as the substitute for official national export statistics (and what to do in such cases) has to be discussed and endorsed by the international organizations and concerned/interested countries.

²⁶ WIOD paper, page 12

²⁷ See *Compilers Guide to IMTS 2010* (UN 2012), 9.47

²⁸ See IMTS 2010, para 4.8(b) and 4.9

by the application of certain rules. This method has been applied by the compiling agency in Brazil;

- ii. By collecting detailed freight and insurance information from a sample of transactions (by commodity, partner and mode of transport) and then using this information to estimate FOB value of other transactions and, consequently, of various aggregates (commodity groups/trading partners/mode of transport combinations). This method has been applied by the compiling agency in Morocco²⁹,

C. Asymmetry due to application of different systems of trade

28. The use of different trade systems is another common reason for asymmetry in international trade statistics. Depending on what parts of the economic territory are included in the statistical territory, the trade data-compilation system adopted by a country (its trade system) may be referred to as general or special³⁰. The general trade system is in use when the statistical territory³¹ coincides with the economic territory, while the special trade system is in use when the statistical territory comprises only a particular part of the economic territory, so that certain flows of goods (which are in the scope of IMTS 2010) are not included in either import or export statistics of the compiling country.

29. Countries may apply various definitions of special trade. Traditionally, the “strict” and the “relaxed” definitions of the special trade are differentiated by trade statisticians. The use of the special trade system narrows the coverage of the statistics because not all goods that are in the scope of international merchandise trade statistics are covered. Moreover, its application is not uniform across countries and creates serious incomparability. For instance, some countries base their recording on the concept of the strict special trade system, while many other countries adopt the different variants of the relaxed definition, including adding to their statistical territories certain (but not all) customs free zones. Therefore, IMTS 2010 encourages countries using this system to develop plans to introduce the general trade system. However, it is recognized that a change from the special to the general trade system would require important administrative restructuring that may be impractical for some countries. Therefore, it is recommended that countries which continue to use the special trade system should compile or estimate missing flows to facilitate the necessary adjustments on a general trade system basis³².

30. It follows that while incorporating trade statistics into global IOT a due attention should be paid to development of the adjustments aiming to minimize the impact of the use of different trade systems. It should be noted that UNSD has made an effort to collect information on the statistical territories of

²⁹ Even though experiences of Brazil and Morocco are encouraging, more country cases have to be studied in order to formulate internationally endorsed guidelines on the best practices in CIF/FOB adjustments.

³⁰ See IMTS 2010, para. 2.12

³¹ The statistical territory of a country is the territory with respect to which trade data are being compiled. The definition of the statistical territory may or may not coincide with the economic territory of a country or its customs territory, depending on the availability of data sources and other considerations. (IMTS 2010, para. 2.1)

³² See IMTS 2010, para 2.38; for example, Panama and Dominican Republic use special trade system but fortunately, both countries have now started to provide UNSD with data on their processing zones as well.

countries³³ and this information can provide a starting point for this kind of work. However, the UNSD publication contains information which is now about a decade old and needs to be updated.

D. Asymmetry in trade in services data

31. *Manual on statistics of international trade in services (MSITS 2010)* recommends that these statistics be compiled on an individual trading partner basis, at least at the level of the 12 major components of the BPM6 classification of services, and, where possible, at the more detailed EBOPS 2010 level³⁴. However, it is recognized that compiling statistics by trading partner is resource-intensive and may be difficult owing to issues related to disclosure and incompleteness of information and recommends giving priority to deriving data for the main trading partners. As MSITS 2010 is aligned with BPM6 the partner country is a country of the residency of the service supplier/consumer. At the moment, the UN Service Trade database contains partner breakdown only for about 20% of its annual country data sets.

32. Asymmetry in trade in services data is also a serious problem. For example, trade in services surpluses exists from both sides between the US and EU for the periods between 2004 and 2012. In 2012, the EU27-USA trade balance has reached the highest level, (as compared with 2004) and amounted to nearly 14 billion euros. Similarly, the USA recorded a trade surplus with EU27 at 36.3 billion euros in 2012³⁵. Efforts are being made to explain and reconcile these differences. Although different data compilation methodologies as well as a possible mis-classification of services versus goods could partially explain the problem both the USA and Eurostat are not yet very definite in their conclusions and state that further in-depth analysis is required.

33. In general, sample surveys of enterprises are perceived to be more accurate for services credits than services debits. This is because exports of services tend to be concentrated in fewer companies, be of a larger size and relate to fewer products than imports of services, where large number of small companies can import a diverse range of products for low value amounts. However, much more research is needed to determine if this general statement accurately explains the asymmetries³⁶.

34. Inclusion of trade in services in global input-output tables is more challenging as the classification used for service categories (EBOPS) is not detailed enough and is not always product based. Promotion of the use of the CPC-based categories of services in enterprise surveys may help in long term to obtain data which might be easier to convert to ISIC industry groups used in global IOT.

³³ See: *Statistical Territories of the World for use in International Merchandise Trade Statistics*, (2005); available at: http://unstats.un.org/unsd/trade/stat_terr_e.pdf

³⁴ See: *Manual on statistics of international trade in services 2010 (MSITS 2010)*, para 3.58; available at: [http://unstats.un.org/unsd/tradeserv/TFSITS/msits2010/docs/MSITS%202010%20M86%20\(E\)%20web.pdf](http://unstats.un.org/unsd/tradeserv/TFSITS/msits2010/docs/MSITS%202010%20M86%20(E)%20web.pdf)

³⁵ See: *ITSS/2014/05 Bilateral trade in services EU vis- à-vis the USA. Which are the right figures?*, page 2

³⁶ This was a conclusion contained in *Preliminary Investigations into Asymmetries in Bilateral Trade in Services between the USA and the UK*; paper for BOPCOM - 07/19, para 13.

35. As a way forward, it can be advised that countries compare bilateral trade in services statistics and reconcile, for instance, by giving higher priority to reported export of services; in addition, allocating high-value services trade to particular CPC product codes would improve the supply-use table.

III Conversion of trade data from HS to activity and end use categories

A. From HS to ISIC

36. The preferred way of linking products to industries is on an empirical basis, namely by linking of basic trade in goods statistics to the business register, and by using integrated business surveys. In recent years good progress has been made in this direction, not only by developed countries, as shown by the Trade by Enterprise Characteristics (TEC) project of OECD/Eurostat and the recent Services Trade by Enterprise Characteristics (STEC) project of Eurostat, but also by developing countries which established empirical links between trade and enterprises at the very detailed levels (e.g., in Costa Rica and Tunisia).

37. However, in absence of sufficient and directly compiled trade by enterprise characteristics data the only feasible way to obtain ISIC (and BEC) trade aggregates needed for building global IOT is to convert HS coded trade statistics using appropriate conversion tables. Of course, it should be kept in mind that, in general, it is “not possible to establish a one-to-one correspondence between activities and products” and that “ISIC is not designed to measure product data at any detailed level”³⁷.

38. In my view the OECD work to create an improved version of Bilateral Trade Database by Industry and End-Use Category (BTDixE) is a significant step forward as this time multiple conversion keys to exploit trade data according to the reported version of HS were used. OECD confirms that it has set up five conversion tables (i.e. one for each version of HS) enabling to map merchandise trade data to ISIC industries and end-use categories³⁸. BTDixE conversion keys are drawn from the various concordance tables published by UNSD. The OECD’s conversion key from the Harmonised System 2007 (HS07) to ISIC revision 4 (ISIC4) is broadly based on a concordance developed by UNSD which maps HS07 commodities to ISIC4 economic activities via the Central Product Classification version 2 (CPC2).

39. The OECD work and other similar experiences should be documented in more detail, thoroughly discussed, amended (if and as necessary) in order to create an internationally endorsed conversion tables for other researchers to use. Experience of countries and other international/regional organizations should be taken into account. It might be worth thinking not only about actual conversion tables but about setting

³⁷ ISIC, Rev.4, para 32

³⁸ BTDixE, page 16

commonly agreed conversion rules, so that other organizations and countries may test them and create their own customized conversion tables - better suited to the national patterns of industrial activities³⁹.

40. It has to be emphasized, however, that the work on (and use of) improved conversion tables should not be seen as a replacement of the efforts to collect data which would reflect actual product structure of inputs used by various industries wherever it is feasible. Any kind of a conversion table will remain a very rough tool by its nature and such tables should be used only if no other ways of linking trade data and industrial activities are available.

B. From HS to BEC

41. Breaking down trade in goods according to their end-use adds a new dimension to the traditional commodity based trade statistics and provides a link to input-output analysis in which flows of goods and services are reported according to end-users. Practically all analysts stress the importance of the UNSD Classification by Broad Economic Categories and use it one way or another (with some modifications) in their work (including both OECD-WTO and WIOD teams). For example, OECD stated that “bilateral flows of exports and imports can be broadly classified into intermediate goods, household consumption goods and capital goods, notably via the keys developed by UNSD to convert from HS classifications to Broad End-use Categories (BEC)⁴⁰. WIOD authors describe their approach as follows: “Our basic data is import flows of all countries covered in WIOD from all partners in the world at the HS6-digit product level taken from the UN COMTRADE database.

42. Based on the detailed product description at the HS 6-digit level products are allocated to three use categories: intermediates, final consumption, and investment. This resembles the well-known correspondence between the about 5,000 products listed in HS 6 and the Broad Economic Categories (BEC) as made available from the United Nations Statistics Division. These Broad Economic Categories can then be aggregated to the broader use categories mentioned above. For the WIOD this correspondence has been partly revised to better fit the purpose of linking the trade data to the SUTs (see section on International SUT)⁴¹. Not only international and regional organizations widely use BEC, it is used by researchers as well. For example, BEC is used to allocate intermediate goods from a particular country source to each use sectors destination countries by Robert Koopman and his colleagues⁴²

43. Conversion of HS data to the appropriate end use categories is even less straightforward than their conversion to ISIC. This is mostly due to the dual use of many goods. This is a well-known fact since the beginning of BEC in 70th. Analysts’ are aware of that and try to find ways to deal with the

³⁹ There are numerous technical challenges to overcome such as how to allocate confidential trade recoded in higher level HS headings, just to mention one. Again, a common effort will be a better option to avoid adding to incomparability of the resulting estimates due different allocation methodologies.

⁴⁰ *OECD Bilateral Trade Database by Industry and End-Use Category (BTDIxE)*, OECD 22 May 2014), page 9

⁴¹ WIOD paper, page 11

⁴² See: *Give Credit Where Credit Is Due: Tracing Value Added in Global Production Chains*, by Robert Koopman and others (2010), page 17

issue⁴³. It should be pointed out that BEC recognizes existence of such goods and states that “the only practical way to make an assignment between the SNA classes of goods in this category is by adopting conventions”; for example, “the conventions are adopted that food grains, when traded internationally, are normally for use by industry, and that fresh fruit and vegetables, when traded internationally, are normally for household consumption”⁴⁴. The conventions used currently in BEC were adopted several decades ago and definitely need revisiting.

44. There exist a valuable experience in this direction including at OECD, EU and others. OECD developed an alternative correspondence table to link HS codes with end-use categories using five distinct “mixed end-use categories” to complement the three major end-use categories, namely: personal computers, passenger cars, personal phones, packed medicines and precious goods. Those additional categories allow to distinguish several consumer-oriented final goods that can be consumed by households, private industries or public sectors (e.g. personal computers and phones), as well as for numerous processed and final consumption products (e.g. precious metals and antique arts)⁴⁵.

45. WIOD approached this task in the following way: “weights have been applied each product at the HS6-digit level allowing for a classification into the three end use categories “Intermediate consumption”, “Final consumption” and “Gross Fixed Capital Formation”. Furthermore, the HS 6-digit data was merged with a correspondence to NACE revision 1 at the 2-digit level as made available by Eurostat corresponding to the CPA classification in the national supply and use tables.”⁴⁶ These experiences should be compared and a common approach has to be developed to improve the comparability of the obtained aggregates and be clear what to promote at the national level.

46. In the case of services there is no BEC type classification. Therefore, the task of converting trade in services data into end use categories is even more challenging as statistics covering bilateral trade in services are generally only available for most countries (in a comparable way) at the total services level. Some countries are able to provide breakdowns of trade in services using the Extended Balance of Payments (2002) breakdown (which has recently been revised, EBOPS 2008) but not typically on a bilateral basis. In this connection work by OECD and other organizations to find acceptable ways of dealing with the problem should be very much supported.

47. It has to be stressed that a serious revision of BEC, including its classification structure, adopted classification conventions and extension of its scope to services, would be a very important practical step towards developing the improved tools for analysis of globalization. Extension of BEC to services can be done by making use of the CPC which is an international statistical standard to classify both goods and

⁴³ Koopman, page 17: “The literature notes that the UN BEC classification has shortcomings of its own however, particularly its inability to properly identify dual-use products such as fuels, automobiles, and some food and agricultural products”

⁴⁴ *Classification by Broad Economic Categories (BEC)*, Series M No. 53, Rev.4, UN 2002, para 14

⁴⁵ BTDIxE, page 9

⁴⁶ WIOD paper, page 27

services and by linking such so revised BEC to EBOPS via appropriate correspondence tables. Such an approach, I think, will be supported by the analysts as well⁴⁷.

48. A revision of BEC is underway in exactly this sense: addition of services and more attention to treatment of dual goods. As reported at the Statistical Commission in 2013, the terms of reference of the technical subgroup on the revision of the BEC stipulated that the subgroup should revise the existing classification and improve it on four points, namely by: (a) Redefining its structure to better reflect the current economic reality; (b) Extending its scope, including with regard to services and goods; (c) Improving the explanatory materials to help both compilers and users of data disseminated according to the classification; (d) Providing updated correspondence tables to link the classification with other statistical classifications. A global consultation on the draft revised BEC was conducted by UNSD in the period of June-September 2014⁴⁸.

IV Way forward: some conclusions/points for discussion

49. To summarize my main conclusions (which can be treated as points for discussion) :
- i. It might be a good idea to prepare an agreed user guide on international trade statistics and measures of trade in terms of value added to provide an explanation of various data sets and their interrelationships to minimize possible misinterpretation; these two kinds of data should complement each other so that users are served in the best possible way; strong points of both approaches may provide a basis for building more powerful analytical tools while their limitations may be mitigated;
 - ii. Clarification of the availability and quality of trade data compiled on the country of consignment basis should be high on the agenda of future work. But, even if there will be progress in this direction, the reduction of asymmetries in so defined partner data is still a hypothesis which is yet to be supported by facts;
 - iii. Import data by the country of origin will remain the most widely available type of import data and the analysts of globalization should take this into account while planning their future work;
 - iv. In the context of point (iii) the most simple and practical way to obtain more reliable estimates of international trade flows in terms of value added (and which might be produced by more and more countries) might be to continue to use national import statistics by the country of origin as the basis global input-output table while making necessary data conversion/adjustments and keeping export data only at the totals level; however, it has to be

⁴⁷ Koopman, page 28 : " To improve the sector level results, current end use classifications, such as the UN BEC, need to be extended to dual use products and services trade."

⁴⁸ See: International statistical classifications, Report of the Secretary-General to 44th session of the UN Statistical Commission, para 41; available at: <http://unstats.un.org/unsd/statcom/doc13/2013-28-Classifications-E.pdf>

- foreseen that there will be cases of significant divergence between the so obtained estimates and official national exports and production statistics, so that the rules how to deal with such cases need to be discussed and agreed by all concerned parties;
- v. Adjustments aiming to minimize the impact of the use of different trade systems by the trading partners should be made and the best way to do it is by combining efforts of interested international organizations and countries; one practical step in this direction can be updating the UNSD publication on statistical territories;
 - vi. Development of an internationally endorsed set of HS-ISIC-BEC conversion tables and agreement of the rules of conversion would be a significant achievement; in view of the accumulated experience it seems realistic in medium term perspective;
 - vii. Revision of the BEC is another important task and should be taken very seriously – in the same way as the development of conversion tables and conversion rules;
 - viii. Continued promotion of linking trade (in both goods and service) and business registers to obtain ever more reliable and detailed data on trade by activities and end-use categories should be seen one of the strategic ways forward; this, however, is a longer term perspective; it should be promoted with the awareness of possible problems with data comparability and resource constraints, and be supported by the coordinated statistical capacity building, especially in developing countries.