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Information items and other business

Report of the Special Session for Eastern Europe, Caucasus and Central Asia and South-East Europe countries on Supply and Use Tables and Input-Output

Note by the secretariat

Summary

The document presents the key outcomes of the Special Session for Eastern Europe, Caucasus and Central Asia and South-East Europe countries on Supply and Use Tables and Input and Output Tables, which took place online on 3-5 October 2022.

The report is submitted to the Group of Experts on National Accounts for information.



I. Introduction

1. The Special Session on Supply and Use Tables and Input-Output Tables for Eastern Europe, Caucasus and Central Asia (EECCA) and South-East Europe (SEE) was held online on 3-5 October 2022. It was organised by the United Nations Economic Commission for Europe (UNECE) in collaboration with the International Monetary Fund (IMF). Gerard Eding, Director of National Accounts at the Central Bureau of Statistics (CBS), Netherlands chaired the special session. Sanjiv Mahajan, Editor of the *Handbook on Supply and Use Tables (SUTs) and Input-Output Tables (IOTs) with Extensions and Applications* and Support Editor of the forthcoming *2025 System of National Accounts* provided key presentations and acted as moderator.
2. The Special Session was attended by over 150 participants from the national statistical offices, central banks and government agencies from the following countries: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Cambodia, Cameroon, China, Denmark, France, Georgia, India, Indonesia, Israel, Kazakhstan, Kyrgyzstan, Madagascar, Mexico, Mongolia, Montenegro, Netherlands, North Macedonia, Republic of Moldova, Russian Federation, Serbia, Solomon Islands, Spain, Sri Lanka, State of Palestine, Switzerland, Tajikistan, Togo, Türkiye, Turkmenistan, Ukraine, United Kingdom, Uzbekistan and Zambia, and representatives from the European Free Trade Association (EFTA), Eurostat, International Monetary Fund (IMF), Interstate Statistical Committee of the Commonwealth of Independent States (CIS-STAT), Organisation for Economic Cooperation and Development (OECD), United Nations Economic Commission for Europe (UNECE), United Nations Economic Commission for Latin America and Caribbean (ECLAC), United Nations Statistics Division (UNSD) and UNDP Turkmenistan.
3. The meeting was also attended by academia (Institute of Soil Science and Agrochemistry, Azerbaijan; Aalborg University, Denmark; University of Development Studies, Ghana; and Leiden University, the Netherlands) and non-governmental organisations (Association of Econometrics and Statistics of the Republic of Moldova and Forum for Nature Protection, Nepal).

II. Organization of the Special Session

4. The Special Session was part of the regional initiatives to support the implementation of the System of National Accounts 2008 (2008 SNA) in EECCA and SEE countries.
5. The Special Session sought to share country experiences in compilation and balancing of SUTs and deriving IOTs based on country presentations and a survey organised prior to the session. The Special Session also discussed issues related to data collection, using SUTs to improve consistency and coverage of the accounts and presented developments in international initiatives for developing inter-country tables and global aggregates. Further, significant part of the session was devoted to different IT tools for compilation of SUTs and IOTs, including short training sessions of two tools developed by IMF to support balancing of SUTs and conversion of SUTs into IOTs.
6. The following substantive topics were discussed based on presentations and supporting documentation:
 - (a) Compilation and balancing of SUTs;
 - (b) Deriving IOTs from SUTs;
 - (c) New developments in SUTs and IOTs; and
 - (d) Conclusions and future work.
7. Summary and conclusions of each session are presented in section III below. All meeting documents and recordings are available at:
<https://unece.org/info/Statistics/events/363361>.

III. Summary of the discussion and main conclusions reached at the workshop

A. Compilation and balancing of Supply and Use Tables

8. The session was organised in two parts:
 - the methodological and practical aspects in the compilation and balancing of SUTs and showcased the country practices in North Macedonia, Georgia, Mexico and State of Palestine, including the use of different automated tools; and
 - introduction of an open-source easy operational tool for balancing SUTs, developed and presented by IMF.
9. SUTs should be at the core of National Accounts and represent a framework to ensure better quality, coherency and consistency of the three approaches to measuring gross domestic product (GDP) and other macroeconomic aggregates. The annual SUTs in current prices and in volume terms together with SUTs at purchasers' price and basic price basis should be the main foundation, however, the compilation may be limited by available resources, data, IT systems, etc.
10. A starting step in compiling the SUTs would be to identify all possible data sources available and look at the data gaps to fill in within the national statistical office, other agencies, at multi-regional level, or internationally. A key next step would be to organize the available information – by using the standard classifications, methodologies, models, etc. Applying internationally adopted classifications and standards would allow comparability over time, not only at the national but also international level. Producing rectangular SUTs with more products leads to improving the quality of deflation and balancing of SUTs but this is also subject to available resources and data.
11. Another aspect to be considered is the level of detail (which may differ) for the compilation, deflation, balancing and publication of SUTs. The disclosure and confidentiality issues need to be addressed when publishing the data. Thus, the publication policy should provide clear and open instructions on the ways to communicate and address the quality limitations, if any.
12. Balancing SUTs is an essential step to investigate the consistency of the primary data (different sources with different classifications or definitions), test the assumptions and assess the quality of the estimates. GDP and other macroeconomic aggregates are preferably the outcome of balanced SUTs.
13. Larger discrepancies always require manual balancing. Expert investigation and consideration for removing or reducing the inconsistencies is important. IT tools (IMF SUT/IOT Balancing tool¹, RAS, NA Builder, etc.) are available to be used to solve smaller imbalances, and the automation helps to save human resources and time.
14. In preparing this Special Session, a survey on SUT/IOT practices conducted by UNECE among EECCA and SEE countries revealed that vast majority of the countries that replied (15 out of 18) compile SUTs: 10 on annual basis, two each five years and in the other three the SUTs are only experimental or with different frequency. The countries that do not compile (3) SUTs have plans to start it in the next years, this activity being provided in the multiannual statistical programmes or development strategies.
15. Many of the countries that compile SUTs have a recent reference year e.g., 2019 or 2020 and six of them use specific software to balance the (small) discrepancies. The SUTs are used by the countries both internally in the statistical office to crosscheck the consistency and completeness of the data and to benchmark national accounts and by external users such as central bank, financial ministries and tax authorities for modelling and forecasting or by researchers for detailed analysis.

¹ Video recordings of tools presentation is available at <https://www.youtube.com/playlist?list=PLe6uBaBVeBZAgysBCwaTppMclkcFzmOo0>,

16. The four country presentations provided useful examples of data sources and organization of the compilation process for SUTs and focussing on the balancing process and the different approaches and tools used to resolve inconsistencies.

17. In North Macedonia, the SUTs are fully integrated into the production of national accounts and are compiled both in current and previous years' prices. Since 2014, they became the tool for balancing preliminary and final annual GDP data calculated using the production and expenditure approaches. The balancing is carried out in two stages. Manual balancing, both vertical by industry and horizontal by product, is applied for larger discrepancies. Automatic RAS procedure is used to resolve the small differences between supply and use by product groups.

18. Mexico uses SUTs as a basis for the elaboration of the Input-Output Table and the update of annual, short-term and regional accounts and satellite accounts. Integrating data from administrative registers, establishment and household surveys and censuses allows National Institute of Statistics and Geography (INEGI) of Mexico to establish a sound data system to support the compilation of SUTs.

19. State of Palestine is using ERETES for the compilation of SUTs. The production process has been organised according to GSBPM (Generic Statistical Business Process Model) approach to maintain sustainable compilation. Enhancing the cooperation between the SUTs experts and the data compilers as well as different data users have been essential for resolving imbalances and improving the data sources.

20. The compilation of SUTs in Georgia started in 2006 and since then several improvements and modifications have been implemented, including the transition to the 2008 SNA and increasing the number of products and industries. The balancing process includes manual balancing at the start, the compilation of data in previous years' prices together with the current price SUTs and the final balancing is performed by automated RAS procedure.

21. The end of the session contained a presentation and training on the IMF SUT Balancing tool (SUTB). SUTB is a free, simple and flexible Excel based application that can be easily adapted to country needs and conditions. It is using an automated procedure that considers predefined constraints and given reliability values of the input unbalanced data. The tool was piloted by Georgia and an updated version including user documentation (both in English and Russian) is available at the website of the Special Session: <https://unece.org/info/events/event/363361>. Countries are invited to download and test SUTB and provide feedback².

B. Deriving Input-Output Tables (IOTs) from SUTs: country experiences and IMF automation tools

22. The session was based on presentations by Türkiye, Georgia and IMF. Similar to the previous session, it combined country presentations on the current situation and practices in compiling Input-Output Tables, followed by a presentation of IMF SUT/IOT Converter, including feedback from the tool pilot testing in Georgia.

23. Resources permitting, it is recommended that the production of IOTs is part of the regular production cycle of national accounts provided their analytical usefulness. It should be aligned and follow the compilation of SUTs. The most frequently applied methods to derive IOTs include Model A (Product by Product) IOTs using the product technology assumption; Model D (Industry by Industry) IOTs using the fixed product sales structure assumption or Hybrid (mix of technologies usually chosen to avoid having any negatives).

24. There are freely available automated tools that can support and save resources in producing annual IOTs if annual SUTs are compiled. Different automated tools (RAS, NA Builder, IMF SUT/IOT Converter, etc.) and approaches are available, which can also be easily adaptable to countries needs and requirements. At the same time, expert consideration

² IMF Balancing tool for follow up questions you may contact: Greg Legoff at: GLegoff@imf.org.

and thinking is important before running the automation process and evaluating the plausibility of the results.

25. The discussions considered the results of the UNECE SUT/IOT survey, according to which, 12 out of 18 countries compile the IOTs on a regular basis (annual, five or three-yearly basis) and one country is producing them ad-hoc. The countries compiling annual SUTs have a recent IOT reference year, e.g., 2019 or 2020. Eleven countries derive IOTs from SUTs, and six are using an IT-based converting tool.

26. Türkiye illustrated the use of NA Builder for converting the last benchmark SUTs into IOTs. The transformation is done using Almon procedure to derive a product-by-product IOTs. Several improvements to the compilation process are foreseen with the update of the benchmark year and the conduction of a new SUT survey.

27. SUT/IOT Converter is a tool developed as part of the technical assistance program of the IMF Statistics Department, is intended to serve compilers of IOTs by way of a spreadsheet-based compilation system. The IO Converter transforms SUTs into IOTs, containing data on the use of domestic production and imports (intermediate consumption, final consumption, capital formation and exports) at basic prices. The tool is free, simple and does not require special training for the implementation and use. It is easily adaptable to specific country requirements. After pilot testing with data for Georgia, an updated version of the user instructions and the tool are available at: <https://unece.org/info/events/event/363361>. Countries are invited to download, test and provide feedback to IMF^{3,4}:

28. Further improvements to the tools (e.g., to include hybrid methods) will be considered and presented in the future.

C. New developments in SUTs and IOTs

29. The session was based on presentations by OECD, Eurostat and Aalborg University and was chaired and moderated by Netherlands.

30. Over the recent years, there is an increased policy need and use of inter-country, global and regional SUTs and IOTs. In this context, different initiatives provide solutions for tracking globalization and environmental impacts, including climate change, direct and indirect domestic effects and spillovers, CO2 footprint estimates, etc. for example:

- OECD TiVA database, 2022 edition (<http://oe.cd/tiva>) and Inter-Country Input-Output (ICIO) database (<http://oe.cd/icio>) providing long annual time-series of ICIO tables: with timeseries for 1995-2020 for 45 industries (based on ISIC Rev.4) and 76 countries + “rest of the world” (All 38 OECD countries, all G20, all European Union and all ASEAN countries, other economic regions).
- OECD CO2 in trade and final demand database (<http://oe.cd/io-co2>) combines ICIO database with statistics on CO2 emissions and other industry statistics to present insights into emitted carbon embodied into final demand and other environmental impacts of global production chains.
- FIGARO (Full International and Global Accounts for Research in input-Output analysis - <https://ec.europa.eu/eurostat/web/esa-supply-use-input-tables/figaro>) is produced annually since 2021 and has become EU Official Statistics benchmarked to the latest official macroeconomic aggregates. The 2022 edition links data on national accounts with business, trade and jobs data for all EU member states, 16 main trading partners and the rest of the world to provide for analysis of economic, social and environmental consequences of globalisation.
- EXIOBASE (<https://www.exiobase.eu/>) is a global, detailed Multi-Regional Environmentally Extended Supply-Use Table (MR-SUT) and Input-Output Table

³ SUT / IOT Converter for follow up questions you may contact: Achille Pegoue at: APegoue@imf.org

⁴ IMF SUT/IOT tools, presented on Special Session on SUT and IOT workshop - YouTube

(MR-IOT) which is a combination of traditional SUTs and estimates of emissions and natural resource extractions. It allows analysis of environmental impacts associated with the final consumption of products.

31. The participants welcomed the developments in these global initiatives that allow to better capture and analyse global interdependencies and noted that all partners and projects should:

- avoid duplication of efforts by communicating and cooperating in initiatives of mutual interest;
- reduce burden on national statistical offices; and
- provide feedback on national data leading thus to improving data sources and processes.

F. Conclusions and future work

32. The session on Conclusions and future work started with a summary of capacity development initiatives in the region of IMF, UNECE and UNSD. IMF presented the initiatives and priorities of the regional capacity development Center for Caucasus, Central Asia and Mongolia (CCAMTAC), which among others provides technical assistance on SUTs and IOTs, and implementation of the SUTs Balancing Tool and IOT Converter.

33. UNSD is involved in the coordination and support for testing and early implementation of the 2008 SNA update of guidance notes. An important prerequisite to help the implementation of many 2008 SNA update requirements⁵ are the well-established SUTs / IOTs in the country.

34. UNECE's capacity development activities refer to global assessments, activities in the framework of ECASTAT project, UNDA 14 micro-projects and Geospatial Project.

35. The participants stressed that the technical assistance should be country and demand driven. At the same time, the international organisations active in the region must cooperate and coordinate their initiatives to avoid duplication of efforts.

36. Proposals for future activities were provided by the participants using online questionnaire. UNECE and partner organizations were asked to organize an in-person session on SUTs/IOTs that would follow up with greater detail on selected compilation issues and provide more examples of practical implementation of the presented IT tools using real country data. The topics that could be covered include trade and transport margins, SUTs in volume terms and balancing. Providing training to the countries that are at early or less advanced stages of implementation would be beneficial.

37. In addition, a range of topics for future special sessions was suggested, including digitalization, globalization, SNA update, new data sources and use of administrative data.

38. The Chair concluded the Special Session by providing the key takeaways, thanked all participants, presenters, organisers and interpreters for the good work and emphasised the importance of continuing organising similar workshops and other technical assistance activities giving priority to the methodological and practical issues suggested by the countries.

⁵ unstats.un.org/unsd/nationalaccount/towards2025.asp