



**Asia-Pacific
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Advancing Free Trade
for Asia-Pacific **Prosperity**

Summary Report of the 2017 APEC TiVA Workshop

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Produced by

Ms Jing Peng / Mr Wang Chunyang

Ministry of Commerce of China

No. 2, Dong Chang'an Street, Beijing, China, 100731

Tel: 86-10-65197765

Email: pengjing@mofcom.gov.cn / wangchunyang@mofcom.gov.cn

For

Asia-Pacific Economic Cooperation Secretariat

35 Heng Mui Keng Terrace

Singapore 119616

Tel: (65) 68919 600

Fax: (65) 68919 690

Email: info@apec.org

Website: www.apec.org

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Summary Report of the 2017 APEC TiVA Workshop

The 2017 APEC TiVA workshop, the 3rd of the four capacity building workshops under the APEC TiVA Database Initiative, took place on August 7–18, 2017 in Nanning, China. It consists of two phases. Phase One of the workshop was five-day lectures and presentations with expert speakers from various statistical agencies of APEC economies, and international organizations such as ADB, OECD, UNSD, and WTO. The topics covered include as key methods for updating and estimating SUTs; converting SUTs from purchaser's price to basic price; estimating import use tables; estimating direct purchases abroad by residents, and domestic purchases by non-residents; reconciling bilateral trade in goods and services statistics; linking trade statistics with SUTs; and policy application of TiVA database. Phase two of the workshop is the hands-on practice program that offers an in-depth, face-to-face collaboration between CTTF/IO experts and economies with technical difficulties to construct their own SUTs. These interactive sessions foster strong commitment to jointly construct APEC SUTs before the deadline. Based on the data submitted and each APEC economy's data situation, CTTF collaborated with APEC economies' participants to compile trade statistics and SUTs to meet the APEC TiVA data requirement.

Some of the best practices can be summarized below:

1. Workflow outline for the APEC TiVA database project

This outline maps out the workflow of the APEC TiVA database construction process, developed jointly by China and U.S. teams, and incorporating OECD's conceptual methodology framework on TiVA database construction. It serves as a general reference to construct the APEC TiVA project. The implementation and related specific technical tasks could change during the course, subject to the availability and quality of submitted data, as well as the time constraint.

(1) Identify additional data need and implement the second round data submission

- 1) Supply and use tables (SUTs) at purchaser's and basic prices, by the APEC standard product and industry classification, if available;
- 2) Alternatively, input and output tables at basic prices, by the APEC standard product and industry classification, if SUTs are not available;
- 3) Import use matrices at CIF price, by the APEC standard product and sector classification, if available;
- 4) National account data for the corresponding SUT/IOT years as well as the APEC TiVA benchmark years (2005 and 2012) for the following categories, if available:
 - a. Imports and exports by industry and/or product (processing trade and merchanting adjusted for the concept of SNA1993);
 - b. Gross output by industry and/or product;
 - c. Value added by industry;
 - d. Final demand by categories;
 - e. CIF-FOB margin rate;

- f. Net tax (tax and subsidy) rate by industry and/or product;
 - g. Value Added Tax (VAT) rate by industry and/or product;
 - h. Trade and transport margin by product;
 - i. Resident and non-resident expenditure;
 - j. Re-exports;
- 5) Output, value added, imports and all final demand categories by volume for any year available for estimating the benchmark year SUTs in absence of official data.

(2). Coordinate and utilize data from alternative sources (e.g. OECD, ADB)

(3). Construct the APECSUTs

- 1) Harmonize and benchmark national SUTs
 - ① Estimate SUTs at purchaser's price (PP) if not available; and adjust the 2008 SNA based SUTs to the 1993 SNA based concept of processing trade and merchanting;
 - ② Harmonize SUTs (PP) to the APEC TiVA industry and product Classifications and benchmark with the national account data of the corresponding years (exports, imports, output, value added, final demand, margins, taxes):
 - a) Estimate national account constraints at the APEC standard industry/product level;
 - b) Harmonize SUTs to the APEC TiVA industry and product Classifications with national account constraints;
 - c) If feasible, evaluate the treatment of re-exports in SUT compilation. In principal, economies should include re-exports in imports and exports in SUTs;
 - ③ For non-benchmark year SUTs, update them with the benchmark year national account data;
- 2) Prepare and process trade statistics
 - ① For merchandise trade statistics, convert import and export value to the same FOB_{pp} price, harmonize geographical coverages, and adjust for re-exports through major re-export hubs, such as Hong Kong, the United States, and Singapore.
 - ② Use official services trade data, as well as other sources of services trade data to estimate missing bilateral services trade data;
 - ③ Estimate the Symmetric Indices for each reporting APEC economies as exporter and importer based on the reconciled trade statistics, and use them as the weight to generate balanced bilateral trade statistics (note: the Symmetric Indices for merchandise and services trade would be estimated separately);
 - ④ Harmonize balanced trade statistics to the APEC TiVA product classifications; align and benchmark to the national account trade data;
 - ⑤ Adjust product exports in balanced trade statistics to be aligned with product exports in use tables introducing known adjustments to harmonize with national accounts concepts; and introduce a column reflecting unallocated exports

reflecting differences between SUT exports by product and the equivalent estimates derived from the alignment steps above. Adjust product imports of corresponding trading partners' accordingly and impose these within the import column - introducing, in turn, an item for unallocated imports.

- 3) Integrate SUTs and trade statistics to construct APECSUTs
 - ① Estimate use tables at "basic price" (including import duties and/or other import specific taxes) and generate margin/net tax matrices for later use in step 7;
 - a) Combined with other available data, estimate domestic margin and net tax matrices (excluding import duties and other import specific taxes);
 - b) Return domestic margins and net taxes embedded in intermediate and final uses to the corresponding margin sectors and tax rows;
 - ② Breakdown use tables into domestic use tables at basic price and import use tables at CIF '*special purchaser's price*' (CIF_{pp}: CIF+ import duties or other import specific taxes);
 - a) Convert national import data to CIF_{pp} by adding import duties and/or other import specific taxes;
 - b) Assign national import with broad end use categories;
 - c) Estimate import use tables at CIF_{pp};
 - d) Derive domestic use tables at basic price;
 - ③ Estimate import use tables at CIF '*special basic price*' (CIF_{bp}) and return import related taxes to the corresponding tax rows;
 - ④ Apply CIF-FOB margin rates to estimate import use tables at FOB purchaser's price (FOB_{pp}); return international insurance and freight embedded in CIF price to a separate row in the import use table;
 - ⑤ Adjust product imports in import use tables to be aligned with product imports in harmonized, benchmarked, adjusted, balanced trade statistics;
 - ⑥ Apply the shares of trading partners by product and end use to generate international use tables at FOB_{pp};
 - ⑦ Apply corresponding trading partners' domestic margin and net taxes rate to estimate international use tables at FOB basic price (FOB_{bp});
 - ⑧ Compile APEC use tables at basic price with global trade discrepancy;
 - ⑨ Eliminate global trade discrepancy to produce balanced APEC use tables;
 - ⑩ Produce APEC supply tables at basic price;
 - ⑪ Convert APECSUTs into symmetric industry-by-industry APECIOTs at basic prices.

2. Key methods for updating and estimating SUTs were introduced as follows:

(1) The methodology for updating SUTs

The Supply Table and Use Table can be updated separately by using the popular RAS method. However, the traditional RAS method requires the data of supply totals by products which are not available for most countries. Therefore, we suggest using the so-called SUT-RAS method which

can jointly updates the SUTs and does not require the data of supply totals by products. This method is also used in the construction of WIOD database.

(2) The methodology for price adjustment

The key process of price adjustment is converting use table from purchaser's price to basic price. Based on the submitted data situation, we designed two scenarios to adjust the price, the first one is for use tables in non-benchmark years and the other is general scenario for use tables in benchmark year. The methodologies for both of the scenarios were introduced to all APEC economies.

(3) The methodology for compiling and adjusting import use tables at basic prices

Import use table is the basic information of compiling APEC-SUTs, most APEC economies didn't provide the import use table along with the SUTs, so after harmonizing and updating the SUTs with national account and adjusting the SUTs prices from purchasers' price to basic price, the import use table should be prepared.

Compiling and adjusting import use table at basic price includes following processes: compiling import use table at CIF prices including import duties; estimating import use table at FOB_{PP}; and constructing the international import use table with trade partners and estimating international import use table at FOB_{BP}.

3. Summary of compiling trade statistics

To construct the APEC trade in value added (TiVA) database, the CTTF Trade Working Team adopted a multi-level reconciliation approach. This reconciliation process is comprised of two major stages: at stage one, officially reported goods and services trade statistics are balanced at the sectoral and bilateral levels; at stage two, we apply the results from stage one to economy's supply use tables, and then reconcile the discrepancies at the sectoral, bilateral and global levels for the construction of the APEC regional supply-use tables (SUTs) and input-output tables (IOTs)—the underlying data for the APEC TiVA database. So far we have completed the first stage of data compilation.

At the first stage of data compilation, the CTTF Trade Working Team developed three reconciliation models to balance goods and services trade statistics at the sectoral and bilateral levels. The models estimate and reconcile trade data covering all 21 APEC economies for years 2005 and 2012. Non-APEC economies are divided into six major trading blocs: (1) the 28-member European Union (EU28); (2) Africa (AFR); (3) Rest of Asia (ASIA); (4) Rest of Latin America (LatAm); (5) OPEC countries (OPEC); and (6) Rest of the world (ROW). Initial data used in the models are either submitted by participating APEC economies, or obtained from international organizations such as IMF, UNSD, WTO, and OECD.

The technical work during the first stage of data reconciliation places specific effort on developing models to reconcile services trade statistics, as this area has the major data issue and thus poses the greatest challenge to producing a comprehensive set of balanced bilateral trade statistics with

sufficient sectoral information. In order to create a consistent and complete data set for bilateral trade in services between APEC economies, a top-down approach is first used to fill in missing data with various rules; then an optimization model with internal consistency constraints is used to obtain a complete matrix of bilateral services trade flows by products between the 21 APEC economies and their six major trading partners. During this phase, a considerable effort was also put in developing a better understanding of global supply and demand of international transport and insurance margin services, which helped develop a feasible approach to achieve the global balance at the next stage of work.

4. Summary of compiling SUT/IOT data

The SUT estimation methodologies and techniques used in the initial stage of SUT data compilation are summarized as follows:

1. For economies that submitted all or most required data that are consistent with the APEC industry and product classifications and valuation requirements, the teams validated and processed the submitted SUT data with or without minor adjustments.
2. For economies that submitted partial benchmark year SUT data, the teams combined the submitted SUT data with data from other sources to estimate the missing SUT components.
3. For economies that submitted non-benchmark year SUT data, the teams integrated the submitted SUT data and benchmark year NAs data using techniques such as RAS-SUT approach or integrated RAS balancing approach, to derive the benchmark year SUT data,
4. For economies that did not submit any SUT data, the teams estimated the benchmark year SUTs/IOTs using economic modelling with unofficial data that are available from research institutes.
5. Additional processes included adjusting submitted data to the APEC required format, transforming industry/product classifications to the APEC classifications, and converting the values of original data from local currency to millions of US dollars using IMF exchange rates.