

Two-stage approach of reconciling trade statistics under the supply-use framework for constructing APEC IOTs

Topic: Compiling and Applying the APEC TiVA Database

Author: Lin Jones

Title: APEC Two-stage approach of reconciling trade statistics under the supply-use framework for constructing APEC IOTs

Authors: Lin Jones (U.S. International Trade Commission), Zhi Wang (George Mason University/UIBE) Abstract

This paper summarizes the two-stage approach of balancing trade statistics at global, bilateral, and sectoral levels under the supply-use framework for constructing APEC IOTs, the underlying data for the APEC TiVA database.

At the first stage, we estimated missing services trade statistics, and reconciled international trade statistics at bilateral and sectoral levels by end use, so that we could derive trading partners' share for each APEC economy by product and end use.

At the second stage, we reconciled international trade data at global, bilateral, and sectoral levels under the supply-use framework with three sequential models: model 1 balanced trade at the global level, by reconciling official NA estimates of each economy's total merchandise and services trade statistics with total exports to and imports from the world reported in that economy's SUTs at the product level. Model 1 produces a set of total export and import vectors at the economy and product levels which satisfy the condition that world total exports (f.o.b) plus an international shipping margin (c.i.f.) equals world total imports (c.i.f.). The global supply and use of international shipping margin services are also balanced simultaneously at this stage, similar to the approach in Streicher and Stehrer (2012), but achieved under a unified modeling framework.

Model 2 reconciled single-economy SUTs with the globally-balanced total exports and imports estimates from model 1 through multiple rounds of optimization process. Data inconsistency for a particular economy/year's SUT are pin-pointed, and constraints are gradually relaxed in each round until all data are balanced.

Model 3 integrated reconciled single-economy SUTs from model 2 with balanced trade statistics from stage one, which reconciled trade vectors in SUTs were disaggregated by trading partners with shares estimated from stage one. Each economy's total exports to and imports from the world derived from model 1 are used as total controls, and distributed among trading partners before the final balancing to produce APEC SUTs without discrepancies. Finally, the balanced APEC SUTs are transformed into Industry by Industry APEC IOTs based on the model D assumption of fixed product sales structure (Eurostat, 2008).

The two-stage top-down APEC TiVA approach allows the optimal utilization of information from available official data sources, while ensuring the resulting inter-economy input-output tables to remain close to official NA data to the extent possible.