



**THE INTERNATIONAL SCHOOL
OF INPUT-OUTPUT ANALYSIS**

MODULES

**21st International Input-Output Conference
Kitakyushu, Japan – July 2013**

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1. Updating Supply, Use and Input-Output Tables

Lecturer: Joerg Beutel

Konstanz University of Applied Sciences (Germany)



Summary

A modern input-output system consists of three types of tables: Supply tables, use tables and symmetric input-output tables. They provide the most detailed portrait of an economy. By now, it is common practice to derive input-output tables from supply and use tables. While supply and use tables mainly serve statistical purposes, input-output tables are mostly used for economic analysis. Supply and use tables constitute the best framework to balance the national accounts at the detailed level of products and industries. As an analytical tool input-output data are conveniently integrated into macroeconomic models in order to analyze the links between supply and demand and other major statistics (employment, capital, energy, environment, etc).

In recent years, several countries have considerably reduced the time lag for the publication of supply, use and input-output tables. However, two main problems remain. Many applications of input-output analysis are obsolete because the database is still outdated or the time series of tables are often incomplete. It is costly to compile symmetric input-output tables, as they rely to a great extent on large surveys and several other primary statistics. This is why many countries only compile input-output tables for certain benchmark years. Updates of input-output tables are essential for economic analysis as supplement for the missing years, but also to cover the time lag between the last submitted input-output tables and the most recent projection of national accounts.

Methods for updating supply, use and input-output tables can be categorised in univariate, bivariate, econometric and stochastic procedures. All methods try to solve the problem that row and column sums of an input-output table should correspond to the exogenous projection and prevent negative inputs. Besides the common procedures a new updating procedure will be presented avoiding arbitrary changes of important input coefficients that sometimes occur if traditional RAS-procedures are applied.

Outline

1. Methods for updating supply, use and input-output tables

- 1.1. Univariate methods
- 1.2. Bivariate methods
- 1.3. Stochastic procedures

2. Empirical applications

- 2.2 Projection of supply and use tables for Slovenia
- 2.1 Projection of input-output tables for Greece

3. Software

Remarks

The objective of the module is to inform the participants about the main methods for updating supply, use and input-output tables. The main methods for updating input-output tables are summarized in Chapter 14 of the “Eurostat Manual of Supply, Use and Input-Output Tables” of 2008. Joerg Beutel drafted his chapter and also estimated many missing supply, use and input-output tables of the European Union for Eurostat, the Statistical Office of the European Union. Small numerical examples help to understand the various compilation procedures. Empirical applications include projections of supply, use and input-output tables for selected countries of the European Union. The software system contains Excel files, SAS programs and Eviews programs which may be used in the future by the participants for their own activities. The students will be informed in time about the website link where they can find support materials for the module. The information will include the PowerPoint presentation for the session, the Eurostat Manual and the software system (Excel, SAS, Eviews) for both the numerical examples and the empirical applications.

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2. The GTAP Data Base and Contributing I-O Tables to the GTAP Data Base

Lecturer: Ángel Aguiar
Purdue University (United States)



Aim: The aim of this course is to explain how the GTAP Data Base is constructed and to provide participants with the tools to contribute an I-O table for a specific country to the GTAP Data Base, using a country I-O table, supply and use table (SUT), or social accounting matrix (SAM).

Session 1: Introduction

Lectures:

- Overview of GTAP Project and Course Motivation (10 mins)
- The GTAP Data Base Construction (20 mins)
- Overview of Course Software and exercises (30 mins)
- Questions and Discussion (30 mins)

Session 2: Using Gempack Programs and Batch Files

Computer Exercises Part 1 (1.5 hours):

- Making a HAR file from excel
- Reading and running tab files
- Using Batch files

Session 3: Converting to GTAP I-O tables

Lectures:

- Strategy and Overview of potential issues (20 mins)
- Questions and Discussion (10 mins)

Computer Exercises Part 2 (1 hour):

- Supply and Use v I-O tables
- Structural Issues: Splitting Imports and Taxes
- Aggregation and Mappings

Session 4: Checking your I-O table

Computer Exercises Part 2 continued (1 hour):

- Supply and Use v I-O tables
- Structural Issues: Splitting Imports and Taxes
- Aggregation and Mappings

Lecture:

- Checking your table and Wrap up (30mins)

Assignment: A certificate could be obtained if the participant contributed an I-O table and documentation to the GTAP Data Base.

3. Environmental Input-Output Analysis

Lecturer: Tommy Wiedmann
University of New South Wales (Australia)



This course introduces principles, techniques and applications of Environmental Input-Output Analysis (EIOA). It presents research questions that can be answered with EIOA, introduces the basics of environmental input-output calculations and deals with special techniques such as mixed-unit and supply and use tables. The principles of hybrid life cycle assessment and multi-region input-output analysis will be introduced and exemplified. Students work with simple, practical examples throughout the course. Participants are encouraged to bring their own laptop.

Module 1 – Basics

- Why EIOA? – Introduction
- Accounting frameworks as basis for EIOA (SNA, SEEA)
- Basic IO calculus (Leontief model)
- Terminology (what does 'embodied', 'footprint', etc. mean)
- Practical examples

Module 2 – Techniques I

- EIOA in a supply and use table framework
- Mixed-unit tables and calculus
- Practical examples
- Derivation of structural path analysis (SPA)

Module 3 – Techniques II

- Applications of SPA
- Principles of hybrid LCA (life cycle assessment)
- Practical examples

Module 4 – Application

- Principles of multi-region input-output analysis (MRIO)
- Applications of MRIO: factor use embodied in trade; national footprint accounting
- Examples from the literature

4. Applied CGE modelling

Lecturer: Eduardo Haddad
University of Sao Paulo (Brazil)



Course Outline

The course aims to introduce participants to the ideas and techniques of regional CGE modelling, and to equip them to start using an operational model, adapting such model for their own simulations. By the end of the course, participants will have been introduced to:

- the theory underlying CGE models;
- the basic structure of CGE models;
- the representation of CGE models in the notation used in GEMPACK;
- the data requirements of CGE models;
- formulating exogenous scenarios;
- computing simulations for policy analysis;
- interpreting and reporting results.

5. Learning to use REAL I-O for regional and global analyses

Lecturers: Norihiko Yamano (OECD) and Geoffrey J.D. Hewings
University of Illinois (United States)



Outline: This course outlines the features of recently updated Input-Output software developed at Regional Economics Applications Laboratory, University of Illinois at Urbana-Champaign jointly with OECD. The software has functions of table operations, displaying basic indicators for regional/country comparisons and advanced analysis using various types of input-output database i.e. non-competitive type table, inter-regional input-output model. The latest version of REAL-IO (previously distributed as PyIO) is capable of increasing additional functions without recompiling the interface part of software code.

Tables of contents

1. Introduction
2. Installation
3. Running software
4. Preloaded functions
 - Input-output table operations
 - Analysis of single-region (country) model
 - Analysis of inter-regional (country) model
5. Installation of additional functions

For further details: <http://www.real.illinois.edu/realio/>