18th IIOA International Input-Output Conference
Sydney, Australia

Teaching sessions

The Scientific Programme Committee (SPC) of the 18th International Input-Output Conference presents the following three sets of teaching sessions on specific topics of interest for input-output practitioners, i.e.: the compilation of supply, use and input-output tables; the specific input-output software SimSIP SAM; and linear programming in input-output analysis. The sessions will be located in rooms with wireless connection to internet and in which the attendants will be able to use their own laptops to follow the lectures. In this conference, the teaching sessions will consist of three sessions of one hour and a half each, which hopefully manage the attendants to get a deeper knowledge of the contents rather than just a one session talk. Participants are encouraged to bring their own laptop. The sessions will be hands-on, and examples and applications will be used so that participants become familiar with the way the tools work and the outputs they produce. The sessions are scheduled for Tuesday, Wednesday and Thursday.

The IIOA and the SPC have put a great effort in providing a set of parallel courses with renowned speakers so we hope you find them interesting. Please, in case you were interested in attending one of these three sets of teaching sessions **DO NOT FORGET TO GIVE YOUR NAME ON SUNDAY AT THE REGISTRATION DESK INDICATING YOUR PREFERENCE!!!** *Please, also fill in our evaluation form and give it back to the registration desk once the teaching sessions are completed together with a list of topics that you would like to see in the form of teaching sessions in the next conference. Your help is very much appreciated to improve the future training capacity of the IIOA.*

1. Supply and Use Tables and links to Symmetric Input-Output Tables

Sanjiv Mahajan (Office for National Statistics, UK)

Special teaching session organized by the Input-Output Statistical Group (IOSG)

Room: Lecture Theatre 1, School of Physics

Over the past 20 years, the role and use of the Input-Output (I-O) framework has developed rapidly within National Statistical Institutions (NSIs), and beyond. In particular, several NSIs produce Supply and Use Tables as the natural framework to bring together components of the three approaches to measuring Gross Domestic Product (GDP), and in turn, when balanced, determining GDP both in current prices and in volume terms.

This training module arranged by Sanjiv Mahajan (Member of the IOSG Board) helps to provide an overview of Supply and Use Tables and their links to the more traditional symmetric I-O Tables.

These training sessions at the IIOA Conference form the first of a series of IOSG led teaching sessions. The training modules are being provided with the aim of developing greater understanding for producers and users as well as developing more detailed and stretching sessions for the future.

This specific module aims to:

- Describe key features, identities and structure of Supply and Use Tables.
- Briefly highlight allocation of economic transactions in the framework (in line with the 2003 SNA).
- Focus on terminology and different types of classifications, for example, industries and products.
- Provide examples of the main sources of data.
- Illustrate how the estimate of GDP can be derived from Supply and Use Tables using the three different approaches.
- Provide a schematic showing the links between Supply and Use Tables and Symmetric I-O Tables (both in current prices and previous years' prices).

The above aspects will lead to a practical exercise. The attendees will have a simple case study and will be requested to populate and balance a simple Supply and Use Table.

Prerequisites

This training session is open to all but two points for attendees to note:

- Basic awareness of the national accounting framework would be desirable but not essential.
- Please bring along a pen and calculator.

2. Linear Programming in Input-Output Analysis

Thijs ten Raa (Tilburg University, the Netherlands)

Room: Lecture Theatre 2, School of Physics

Input-Output Analysis presumes constant returns to scale in production and, therefore, is a form of linear economic analysis. Another form of linear economic analysis is Linear Programming. There are differences. First and foremost, Linear Programming presumes optimization, whereas Input-Output Analysis does not require this. There are also commonalities. First, both approaches have a primal quantity system and a dual price system. Second, applied general equilibrium models with an input-output core can be solved using linear programming. In this mini course I teach the theory of Linear Programming and its application to Input-Output Analysis.

In the first part we quickly review the dual equations of Input-Output Analysis and then introduce the theory of Linear Programming. It is a case of constrained optimization. We will set up so-called shadow prices, one for every constraint, and derive the phenomenon of complementary slackness and the main theorem of linear programming. We will reconnect

the latter to the national income identity of Input-Output Analysis. We will show that shadow prices measure productivity.

In the second part we will zoom in on an important application of Linear Programming, namely Data Envelopment Analysis. This now popular technique is used to assess the relative efficiency of firms, industries or even national economies. There is a connection between efficiency and productivity and we will explain it in detail. In the third part we combine what we have learned in applied general equilibrium modeling with an input-output core.

Thijs ten Raa, *The Economics of Input-Output Analysis*, Cambridge University Press, 2005

3. SimSIP SAM

Juan Carlos Parra (World Bank, USA)

Room: Lecture Theatre 5, School of Physics

Participants are encouraged to bring their own laptop and data. The sessions will be hands-on, and many examples and applications will be used so that participants become familiar with the way the tool works and the outputs it produces.

Session 1 - Introduction to SimSIP SAM: General description of the tool, its features, capabilities, and limitations. Installation of SimSIP SAM on personal laptops. How to load an IO table or SAM into the tool. This session is mandatory for anyone attending sessions 2 or 3.

Session 2 - Preparing your SAM and multiplier analysis: SAM organization, aggregation, and balancing using RAS and Cross-Entropy with constraints. Descriptive analysis and labor multipliers. The inverse matrix, multiplier decomposition, and economic linkages. Design of experiments for quantity and price models.

Session 3 - Structural change, supply constraints, and poverty analysis: Importance of technical coefficients, first-order fields of influence, economic landscape, and directions of change for two inverse matrices. How to impose supply constraints for zero and small excess capacity. Design of experiments under supply constraints. Poverty and income distribution analysis using a household survey.