



## Intro to Computable General Equilibrium (CGE) Modelling with GAMS

### BACKGROUND

Most economics curricula deal with macroeconomic tools for studying the economy as a whole and microeconomic tools for studying the behaviour of individual agents or markets. However, many policies create costs and benefits that extend beyond the targeted sectors or agents. Furthermore, the impacts on the policy targets are themselves conditioned by the macroeconomic adjustment processes and the structures and institutions of the economy in which they are implemented. Practical public and private sector policy analysts thus often need an economy-wide perspective on the policies they design, implement and monitor.

Economic modelling techniques that capture these economy-wide impacts are increasingly being used in policy, consulting, research and academic environments. Input-output and social accounting matrix (SAM) analysis are used on a regular basis to analyse the impact of policy-related and other changes on the economy. Computable general equilibrium (CGE) models build on these techniques to allow for a wide range of behavioural responses and interactions. While these techniques were once the preserve of a handful of leading theoreticians, the IT revolution has allowed them to become part of the practical economist's everyday toolkit.

In 2001 Trade and Industrial Policy Strategies (TIPS) started (co-)presenting introductory workshops to cater for the rising demand for these techniques. Since then it has held more than thirty such workshops, with more than 500 participants from over 30 countries.

The accumulated experience of running these workshops suggests that there are three different kinds of model users, each requiring different skills. Firstly, **modellers** need the skills to adapt existing models for new applications and to develop new models completely. Secondly, many **policy analysts** need to use economy-wide models routinely in their work. They may want to run and interpret the results of standard models dealing with their specific issues. They also may want to be able to interact with modellers when commissioning work from them. Finally, while never needing to run models themselves, many **senior policy managers** draw on modelling work undertaken by consultants and others. They need to know when the methods are appropriate and to be able to interrogate the results properly.

TIPS has evolved a suite of three related introductory workshops designed to meet these different needs.

- A. Economy-Wide Policy Impact Analysis
- B. Introduction to Economy-Wide Modelling for Policy Analysis
- C. Computable General Equilibrium modelling using GAMS

All three workshops focus on learning by doing. Brief presentations introduce the various topics, after which participants do hands-on exercises implementing what they have learned. There is also emphasis on the nature of the data underlying the models. Participants undertake projects dealing with typical issues, using real world data.

The first of these three workshops, **Economy-Wide Policy Impact Analysis**, is suitable for all three of kinds of users mentioned above. It introduces participants to input-output, SUT and SAM multiplier analysis and their extensions. These techniques are widely used to assess the likely impact of policy and other shocks to the economy. They can also form the basis for many CGE models. All the models are implemented in MS Excel.

### WHO SHOULD ATTEND

Intending Modellers

### SKILLS REQUIRED

Workshop A and/or B or equivalent workshops elsewhere

Ability to manipulate and interpret algebraic expressions

### Workshop fees

(which includes teas, coffees and lunches):

**R18,810** (VAT incl) per participant.

**Dates:** 23-27 October 2017

### Venue:

TIPS Offices | 234 Lange Street | Nieuw Muckleneuk | Pretoria, South Africa

## Feedback from of our past participants:

*"It was a very informative workshop, will be interested in attending the next one"*

*"All lectures and exercise was well tied up (built up) together. So all parts were interesting and useful"*

*"attract people by how powerful CGE Model can be, what we get from the model"*

*"thank you for the learning experience"*

*"more detailed guidance on how individuals can develop their modelling ability"*

*"very good workshop. We need to repeat after a year"*

## Schematic Programme for Workshop (subject to change)

	<b>Introduction to Computable General Equilibrium modelling using GAMS</b>
<b>Day 1</b>	<ul style="list-style-type: none"><li>• Introduction to Computable General Models</li><li>• Modelling with GAMS</li><li>• Partial equilibrium models in GAMS</li></ul>
<b>Day2</b>	<ul style="list-style-type: none"><li>• A simple CGE</li><li>• Introducing intermediates, macroeconomics, non-homogenous factor markets and unemployment</li></ul>
<b>Day 3</b>	<ul style="list-style-type: none"><li>• Adding government and the rest of the world</li><li>• Lectures on special topics in CGE</li></ul>
<b>Day 4</b>	<ul style="list-style-type: none"><li>• Using the IFPRI standard model</li><li>• Applying the IFPRI model and mini-projects</li></ul>
<b>Day 5</b>	<ul style="list-style-type: none"><li>• Presentation of mini-projects</li><li>• Moving forward</li></ul>

## ABOUT THE FACILITATORS

### Dirk van Seventer

Dirk Ernst van Seventer lives in New Zealand. He studied economics in the Netherlands and subsequently worked for 20 years as an economic analyst in South Africa amongst others as a research fellow at TIPS. After a 6 year stint at the New Zealand Department of Labour Dirk van Seventer has recently rejoined TIPS as a part-time research fellow where his work focuses on trade and economy-wide policy analysis and capacity building.

### Rob Davies

Rob Davies is a Zimbabwean economist who lives in Harare. He was associated with the University of Zimbabwe for more than 30 years. He has also taught at universities in South Africa, the UK and the US. He is currently an independent researcher and works closely with the South African National Treasury and with TIPS.

No pre-reading is required for any of these workshops and all necessary materials will be provided for the course. However, interested participants may wish to consult the following references as preliminary reading

Lofgren, H; Harris, DL & Robinson, S, 2002, *A Standard Computable General Equilibrium (CGE) Model in GAMS*, Microcomputers in Policy Research 5, <http://www.ifpri.org/publication/standard-computable-general-equilibrium-cge-model-gams-0>

Lofgren, H, 2003, *Exercises in general equilibrium modeling using GAMS and key to exercises in CGE modeling using GAMS*, Microcomputers in Policy Research 4a, <http://www.ifpri.org/publication/exercises-general-equilibrium-modeling-using-gams-and-key-exercises-cge-modeling-using-g>

If you are interested in attending this workshop please contact:

Rozale Sewduth  
(rozale@tips.org.za)

Note: The offering of the workshop is dependent on attracting a minimum number of 12 students by the time of the payment closing date while the maximum number of students is 20. Note that TIPS will not make refunds after the payment due date unless the workshop is cancelled. TIPS's invoice documentation (tax clearance, bank clearance, etc) will only be sent on request by registered post. It is therefore important to make sure that TIPS is on your organisation's list of preferred suppliers and to factor-in sufficient time for these processes