Intermediate Computable General Equilibrium (CGE) Modelling: Online Single Country Course

Course Description

This course is an intermediate course in practical computable general equilibrium (CGE) modelling using the General Algebraic Modelling System (GAMS) software. The course is designed for individuals who have a well-developed background in economics and basic CGE modelling, who wish to develop the technical skills needed to become a CGE modeller and/or become competent users of modern comparative static single country CGE models. The course emphasises the development of the skills required to develop systematic policy experiments and the interpretation of the results from those experiments. The course also develops the participants understanding of the behavioural relationships in, and the calibration of, CGE models, while enhancing GAMS coding skills. The course uses a mix of video presentations (lectures and 'how to' videos), practical computer exercises and policy analyses exercises.

The materials are organised in 5 modules offered over 6 weeks (with a one week allowance for 'slippage'). The first three modules have a total of 18 components, each of which is designed to require approximately 2 to 3 hours of input from the participants. The fourth module has two components each of which is designed to require approximately 6 to 9 hours. The final module of the course is devoted to a guided research project that should require 12 to 18 hours of input. Thus, participants should allocate 60 to 90 hours over 5 weeks to complete the course. A fast track, three week (with a one week allowance for 'slippage'), version of the course is available for those participants who can work full-time on the course.

Participants on this introductory course are required to have completed the 'Practical Computable General Equilibrium (CGE) Modelling course' (see www.cgemod.org.uk/introcge.html for details) or provide proof of equivalent or greater skills. The methods used in this course require an understanding of Social Accounting Matrices (SAMs), and the relationships between SAMs and CGE models.

The course is delivered via an electronic learning environment – Moodle. Moodle provides an environment that allows the delivery of learning materials in a structured and organised manner, and an asynchronous forum in which participants can engage with other participants and with the course tutor. The course tutor is available, by email and/or the Moodle message system, to answer specific questions and provide help with problems: questions and requests for advice submitted between 0800 and 1600 UTC will be responded to by the end of the next working (Monday to Friday) day, i.e., by 1600 UTC. Each module requires the participants to submit an assignment; this allows the tutor to monitor progress and understanding, and to intervene if participants are not understanding concepts and techniques or having difficulties. Feedback is provided for each assignment.

The course assumes that the participants have an in-depth knowledge of microeconomic theory, especially general equilibrium theory, and a reasonable understanding of standard techniques of mathematical economics, especially those relating linear homogenous functions. It is assumed that participants have appreciable experience with programming in GAMS and in the use of MS Excel.

This course does NOT use a GUI (Graphical User Interface) to access GAMS. Experience has demonstrated that the use of GUI's by participants on training programmes typically limits the development of the skills needed to be a good CGE modeller or user of CGE models, while encouraging the belief that CGE models are 'black boxes'. Basic GAMS programming skills, and an understanding of economic theory, demonstrates that allegations that CGE models are 'black boxes' are false. The development of GAMS, or GEMPACK, programming skills greatly extends the ability of the user to exploit the power of CGE models, while, at the same time, opening up the potential that participants can, in the future, change behavioural relationships in CGE models.

Course Aims and Objectives

<u>Course Aims</u>

To develop the CGE modelling skills of participants (using GAMS) so they

    i)   understand the behavioural relationships used in CGE models;

    ii)   understand the impact of different behavioural relationships used in CGE models;

iii)   understand the calibration of the behavioural relationships in CGE models;

iv)   can formulate appropriate CGE policy experiments; and

v)   can interpret the results generated by single country CGE models.

Course Objectives

On completion of the course the participants will be able:

i)   formulate and code appropriate policy experiments;

ii)   identify and understand the strengths and limitations of CGE models;

iii)   modify behavioural relationships;

iv)   interpret the results from single country CGE; and

v)   identify, and present, the policy implications of simulations using single country CGE models.

Timetable

	Date
Final date for registration	Monday 1st January 2018
Final date for (cleared) payment of course fee	Monday 1st January 2018
(Standard) Intermediate CGE Modelling Course begins	Monday 22nd January 2018
(Short) Intermediate CGE Modelling Course begins	Monday 12th February 2018
Intermediate CGE Modelling Course ends	Sunday 4th March 2018

Course Fees

Category	Developed Economy Rate	Developing Economy Rate
Professional	£(GBP)1,000	£(GBP)825
Student	£(GBP)700	£(GBP)550
Scholarship		£(GBP)150

A c10% reduction in the course fee is offered to applicants that pay for the 'Practical CGE Modelling course' and the 'Intermediate CGE Modelling course' course by Friday 20th October 2017, i.e., £1,700 (professional developed); £1,400 (professional developing); £1,150 (student developed); £900 (student developing); £200 (scholarships).

Notes:

1. Developing economies are those classified as 'Low-income economies' and 'Lower-middle-income economies' by the World Bank at the time an application is made.

2. Payments in GB pounds (sterling) are by electronic/wire transfer or international cheque. Payees should pay their own bank fees and any currency fees, but not the bank fees of CGEMOD. Clearance of payments typically takes 3 to 5 working days after the funds are received by a UK bank.

3. Students are required to correspond from an academic email address and provide confirmation of their status from an academic advisor with an academic email address.

4. A limited number of scholarships are available to students from developing countries. Applications for a scholarship must be made at the time of registration; applications must be accompanied by a case for being awarded the scholarship that is not longer than one-side of A4/US letter. Applicants must be registered at a degree awarding institution, correspond from an academic email address and provide confirmation of their status from an academic advisor.

Cancellations

All cancellations are must be sent to Karen Thierfelder (karen@cgemod.org.uk). An 80% refund of payments made for both courses, in GBP after our bank and currency charges but excluding the recipients bank fees, will be available for all cancellations received by Monday 9th October 2017. A 75% refund of payments for the intermediate course, in GBP, will be available for all cancellations received by Monday 25th December 2017. Refunds of payments made for both courses, in GBP, will be available for all cancellations for the second ('intermediate') course received by Monday 18th December 2017 (£500 (professional developed); £400 (professional developing); £300 (student developed); £200 (student developing); £0 (scholarships).

Further Information and registration

For further information and registration please contact Professor Karen Thierfelder

Email: karen@cgemod.org.uk

Intermediate CGE (Online) Course

Module O6: A Simple CGE Model: Theory

	Topic	**Tasks**	**Exercises**
O6:1	A SAM Approach to Modeling; Prices and Accounting Identities	Deriving price definitions	Calculating price definitions from SAM data
O6:2	Final demand; Linear expenditure system	Calibrating utility and production function parameters	Calculating LES parameters from SAM data
O6:3	Production Relationships in a Simple CGE Model	Calibrating utility and production function parameters	Calculating CES parameters from SAM data
O6:4	Model Set up and Calibration	Setting up and testing SMOD	Testing the model
O6:5	Macroeconomic Closures in a CGE Model	Changing macroeconomic closures in SMOD	Testing the model changes
O6:6	Factor Market Clearing in a CGE Model	Changing factor market clearing in SMOD	Testing the model changes

Module O7: A Simple CGE Model: Techniques

	Topic	**Tasks**	**Exercises**
O7:1	Tax Instruments & Revenues in SMOD CGE Model	Setting up tax replacement instruments	Testing the model changes
O7:2	Tax experiments in SMOD	Coding tax policy experiments; interpreting the results	Tax experiments and interpreting results
O7:3	Tax experiments in SMOD and Macroeconomics closures	Coding tax policy experiments with tax replacement; interpreting the results	Compound tax experiments and interpreting results
O7:4	Tax experiments in SMOD and factor market clearing	Coding tax policy experiments with different factor market closures; interpreting the results	Compound tax experiments and interpreting results
O7:5 & O7:6	Collecting and interpreting results	Collecting results; interpreting the results from experiments	Collecting and interpreting results

Module O8: The STAGE (1) CGE Model: Theory & Setup

		Topic	Tasks	Exercises
O8:1		Overview of the STAGE Model; Introduction to a STAGE Database; Additional Price Linkages in the STAGE Model	Evaluating the SAM database; deriving price definitions	Calculating SAM coefficients; Calculating price definitions
O8:2		Trade Relationships in the STAGE Model; Nested Production Relationships in STAGE	Calibrating trade and nested production function parameters	Calculating parameters for CES/CET and nested CES functions from SAM data
O8:3		Model Set up and Calibration	Running and Checking the STAGE 1 Model; User configuration options	Checking the model is correctly calibrated and implemented
O8:4, O8:5 & O8:6		Taxes and Efficiency in the STAGE Model	Evaluate the effect of increased factor efficiency in the STAGE model	Interpreting model results

Module O9: The STAGE (1) CGE Model: Policy Experiments and Interpretation

	Topic	Tasks	Exercises
O9:1	Designing Policy Experiments and Simulations	Interpreting Model Results 1	Trade policy experiment
O9:2	Writing and Presenting a Report/Paper	Interpreting Model Results 2	World price change experiment

Module O10: Course Project

The objectives of the project are to develop your ability to (i) implement policy experiments in a small CGE model; (ii) interpret the results of your policy experiments, (iii) carry out systematic sensitivity analyses and (iv) present a report. There are five elements to the project; model recalibration, experiment programming, policy experiments and interpretation, sensitivity analyses and project report.

The available data are SAMs for (approx.) 5 countries (we only use SAMs (and their aggregations) that we have tested to ensure they provide an appropriate learning environment). The number of commodity, activity, factor, tax, and domestic institutions varies by country, but all have 1 (one) rest of the world account.

Your remit is that of an economic consultant who has been employed to analyse policy issues that are relevant and current to your chosen country, and can be conducted using the chosen country's SAM. You are required to identify the policy issue, code the policy experiments, interpret and write up the results and conduct sensitivity analyses. The final report will be a maximum of 15 pages, including all tables and graphics.