

Introduction to Input-Output and Applied General Equilibrium Models

Semester: Spring semester 2022

Root Number: 477683

ECTS: 3

Lecturers: Hugo Rojas-Romagosa and Patrick Tomberger

Dates: 20 – 24 June, 2022

Audience:

The *CAS TradeMod* is aimed at professionals, researchers and graduate students (Masters and PhD), notably in Economics and Social Sciences. Undergraduate students will be considered only if their profile is outstanding.

Course description

The emphasis of this course is twofold. The first one focuses on the basics of input-output matrices and their extensions to multi-region input-output (MRIO) tables. This part will be complemented by a discussion on recent applications of the MRIO framework to measure trade in value added and to construct environmental footprints. It will culminate into a discussion on how introducing different institutional accounts (household, firms, the government, savings/investment, rest of the world) the input-output framework can be extended to create a social accounting matrix (SAM), which constitutes the data basis for applied, or computable general equilibrium models (AGE/CGE), the subject of the second emphasis of this course.

In this block a general introduction to AGE/CGE models is given, followed by theoretical and hands-on sessions where we analyze the economic effects of several policy measures such as changes in national or international shocks in such models. We will work with the AGE model developed and maintained by the global trade analysis project (GTAP).

Lecturers

Hugo Rojas-Romagosa

Hugo Rojas-Romagosa is a research economist at the World Bank. He worked as senior fellow researcher at the World Trade Institute in Bern (2018-2020), as a senior researcher at the CPB Netherlands Bureau for Economic Policy analysis (2006-2018), and previously at the Central Bank of Costa Rica. He has been part of several EU-funded projects and has done consultancy work for many international and national organizations, including the World Bank, the Inter-American Development Bank, UNCTAD, UNDP, ECLAC, OECD, the Vienna Institute for International Economic Studies and INCAE Business School (Costa Rica). More recently he has done trade-policy consultancy work for the British and Swiss governments. He obtained his PhD in economics from the Erasmus University Rotterdam and holds a Master of Philosophy from the Tinbergen Institute in The Netherlands. His research interests include trade theory and trade policy, quantitative trade analysis (CGE modelling and gravity estimations), FDI and trade in services, trade in value-added and global supply chains, globalization and labour markets, income distribution, human capital, international migration and economic development.

Patrick Tomberger

Patrick Tomberger is a senior postdoc researcher at the World Trade Institute located in Bern, Switzerland. Before he joined the WTI, he worked as a predoc researcher at the University of Linz from 2010 to 2015 where he obtained a PhD in Economics. He also holds Master degrees in Political Economy and Political Science from the University of Innsbruck. He also worked as consultant for the World Bank and the OECD and has been part of projects funded by the European Union and the Swiss National Science Foundation. His main research interests are international trade, global value chains, input-output analysis and environmental economics. In those fields he published in international peer-reviewed journals such as Applied Economics, The World Economy, Ecological Economics, Economics Letter, Empirical Economics, and Environmental and Resource Economics.

Grading:

Grading will be based on a take home exam where the participants have to work on a small applied project using input-output matrices and the AGE model discussed in class.

Literature:

The course will rely mainly on the following sources, which the students can find in the ILIAS system:

- Burfisher, M. (2016): Introduction to Computable General Equilibrium Models. Second Edition. Cambridge University Press.
- Cardenete M.A., Guerra, A-I., and F. Sancho (2017): Applied General Equilibrium -- An Introduction, Second Edition, Springer. Chapter 2.
- Dixon, P.B. and D.W. Jorgenson (2013): Handbook of Computable General Equilibrium Modeling, Elsevier. Chapters 1 and 2.
- Miller, R.E. and P.D. Blair (2022): Input-Output Analysis – Foundations and Extensions, 3rd edition, Cambridge University Press. Chapters 1 – 3.

Software requirements:

For the exercises in the IO part we encourage the usage of the free software “R” and the, also free, IDE “RStudio”. This software is available for download at:

- <https://www.rstudio.com/>

In the AGE part we will work in class and for the project with the software “RunGTAP”, which can be downloaded for free at:

- <https://www.gtap.agecon.purdue.edu/products/rungtap/default.asp>

Important: “RunGTAP” will only run on Windows OS out of the box. We strongly encourage the participants to work with that OS in the course. For Mac users we will additionally provide a version of “RunGTAP” specifically developed for that purpose by Joseph Francois. However, we had trouble with that software on some versions of Mac OS in the past, so it should be considered as a second best option only.

As yet another alternative, we suggest Mac users to install a trial version of Windows, which is available on the Microsoft website, in a virtual environment. As virtualization software we recommend the free available software “Virtualbox” for Oracle, available at:

- <https://www.virtualbox.org/>

Course Overview

Class	Date	Lecturer	Time	Hours	Topic
1	20.06.	Tomberger	10:00-12:30	2.5	Introduction to input-output tables
2	20.06.	Tomberger	14:00-16:30	2.5	Constructing multi-region IO tables
3	21.06.	Tomberger	10:00-12:30	2.5	MRIO applications and introduction to social accounting matrices
4	21.06.	Tomberger	14:00-16:30	2.5	Introduction to AGE/CGE models
5	22.06.	Tomberger	10:00-12:30	2.5	Theory session 1
6	22.06.	Rojas-Romagosa	14:00-16:30	2.5	Hands-on session 1
7	23.06.	Tomberger	10:00-12:30	2.5	Theory session 2
8	23.06.	Rojas-Romagosa	14:00-16:30	2.5	Hands-on session 2
9	24.06.	Rojas-Romagosa/Patrick Tomberger	13:00-17:00	3.0	Hands-on session 3; preparation for take home projects