

APPLIED GENERAL EQUILIBRIUM MODELLING ON TRADE POLICY AND DEVELOPMENT

Semester: Spring Semester – HS 2021

Root number: 453214-HS2020-0

ECTS: 3

Lecturers: Eddy Bekkers and Hugo Rojas-Romagosa

Location: In response to the COVID-19 pandemic and following the guidelines established by the University of Bern, all courses of the 2021 WTI Summer Academy will only be held online. This course will have live sessions on Zoom.

Dates: June 28 – July 3 2021

Course Organization:

- Class will be from Monday to Thursday from 11:00 until 13:30 and from 14:00 until 16:30. Classes will be taught live on Zoom
- Group presentations on Saturday July 4, 11.00-12.00
- Please read the compulsory literature and prepare the exercises handed out.

Audience:

- Government officials; Embassy staff; people working for international organisations and NGOs
- Master of Advanced Studies of International Law and Economics (MILE) Students
- Joint LL.M. / Diploma of Advanced Studies Trade and Investment Law (TRAIL+) Students - World Trade Institute / Faculty of Law, Unibe
- Certificate of Advanced Studies / Diploma of Advanced Studies in International Law and Economics (CAS ILE & DAS ILE) Students - World Trade Institute, Unibe
- Students from different universities across Switzerland

Course description:

The goal of the course is to familiarize students with the tools employed to conduct applied general modelling experiments and to teach students how to conduct trade policy simulations at an introductory level employing computable general equilibrium (CGE)-models. CGE-models are applied to a wide range of policy questions, in particular trade policy questions. However, they are also the main tool to analyse the economics of climate change policy. The students will be introduced into the theoretical structure of the CGE-model GTAP and learn how to implement trade policy shocks in RUNGTAP/GEMPACK and interpret the results. The course will focus on applying the modelling tools to practical policy experiments in trade policy and also development. The course concludes with a group assignment to calculate the macroeconomic and trade effects of a trade policy experiment.

Lecturers:

Eddy Bekkers is research economist at the World Trade Organization. He holds a PhD from Erasmus University Rotterdam and Masters in Economics and Econometrics from the University of Amsterdam. He was assistant professor at the Johannes Kepler University in Linz for six years and postdoctoral researcher at the University of Bern for three years. He conducts research on a wide range of topics in international trade: firm heterogeneity, gravity modelling, traded goods prices, food price pass through, foreign affiliate sales and trade in services. He has published in peer-reviewed journals such as Economic Journal, the European Economic Review, the Review of International Economics, Economics Letters, World Economy, the Journal of Global Economic Analysis, the Canadian Journal of Economics. In his current work at the WTO, Eddy is the main economist working with the WTO Global Trade Model, a recursive dynamic CGE model employed to make long-run projections and to conduct policy simulations at the WTO.

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 organisations, 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). He obtained his PhD in economics from the

Erasmus University Rotterdam. His research interests include: trade theory and trade policy, quantitative trade analysis (CGE modelling and gravity estimations), FDI and trade in services, non-tariff measures, globalisation and labour markets, trade liberalization and income distribution, trade in value-added and global supply chains. He has published in international journal such as the Economic Journal, the Journal of Development Economics, World Economy, Economic Modelling, De Economist, Economic Systems Research, FinanzArchiv: Public Finance Analysis and the International Labour Review.

Learning Objectives:

After the course, participants should be able to:

- Explain the basic structure of applied general equilibrium models used for trade policy experiments.
- Understand the basics of the theory of the standard CGE-model GTAP.
- Work with the RUNGTAP software and be able to run basic policy experiments.
- Map gravity estimates into trade policy shocks by calculating ad valorem equivalents.
- Apply the CGE-model to conduct experiments on trade policy and development, interpret the results and report on the results at a basic level.

Exam and Grades:

The grade consists of two components. A group presentation on the conducted simulations on Saturday afternoon (30%) and a written report on the simulations presented on Saturday (70%), to be handed in on Sunday July 5 at 2 pm. The exercise for the group exercise will be handed out on Thursday afternoon.

Course Overview:

Class	Date	Day	Time	Lecturer	Topic
1	28. June	Monday	9:30 12:00	Eddy Bekkers	Intro. to Applied General Equilibrium Models and CGE-Model GTAP
			14:00 16:30	Hugo Rojas-Romagosa	Theoretical Structure CGE-Model, Calibration and Data
2	29 June	Tuesday	9:30 12:00	Eddy Bekkers	Closures and Implementation of Shocks
			14:00 16:30	Hugo Rojas-Romagosa	Parameter Choices, Policy Shocks and Interpretation of Effects
3	30. June	Wednesday	9:30 12:00	Eddy Bekkers	Mapping Gravity Estimates into Policy Shocks
			14:00 16:30	Hugo Rojas-Romagosa	Application to Experiments on Trade Policy (first part)
4	1. July	Thursday	9:30 12:00	Eddy Bekkers	Application to Experiments on Trade Policy (second part)
			14:00 16:30	Hugo Rojas-Romagosa	Discussion of Exercises, Handing out of take-home exam

MONDAY, 28 JUNE 2021

Morning: Introduction to applied general equilibrium models and CGE-model GTAP

Topics

- Introduction applied general equilibrium models
- Structure of CGE-Model GTAP I
- Overview of data
- Introduction to software RUNGTAP
- Hands-on exercises

Compulsory Reading Material

- Burfisher (2011). Computable general equilibrium models. Chapter 2. Elements of a computable general equilibrium model. Chapter 3.
- Hertel et al. (1997) Global trade analysis. Modelling and applications. Hertel and Tsigas. Chapter 2. Structure of GTAP

Afternoon: Theoretical structure CGE-model, calibration and data

Topics

- Structure of CGE-Model GTAP III
- Overview of data
- Calibration of model
- Hands-on exercises with RUNGTAP

Compulsory Reading Material

- Hertel et al. (1997) Global trade analysis. Modelling and applications. Hertel and Tsigas. Chapter 2. Structure of GTAP

Optional Reading Material

- A. Aguiar, B. Narayanan and McDougall (2016). An overview of the GTAP 9 database. Journal of Global Economic Analysis, Volume 1 (2016), No. 1, pp. 181-208.

- Burfisher (2011). Computable general equilibrium models. Chapter 3. The CGE model database: a social accounting matrix.

TUESDAY, 29 JUNE 2021

Morning: Closures and implementation of shocks

Topics

- Closures in RUNGAP
- Implementation of shocks in RUNGAP
- Hands-on exercises RUNGAP

Compulsory Reading Material

- Burfisher (2016). Computable general equilibrium models. Chapters 4-6

Afternoon: Parameter choices, policy shocks and interpretation of effects

Topics

- Parameter choices
- Implementing policy shocks: tariff shocks, technology shocks, non-tariff trade cost shocks
- Interpreting results
- Hands-on exercises on parameters, policy shocks and closures

Compulsory Reading Material

- Burfisher (2016). Computable general equilibrium models. Chapters 7-8

WEDNESDAY, 30 JUNE 2021

Morning: Mapping gravity estimates into policy shocks

Topics

- Review gravity estimation
- Calculating ad valorem equivalents
- Mapping gravity estimates into policy shocks in RUNGTAP

Compulsory Reading Material

- Bekkers and Rojas-Romagosa (2019). Quantitative Trade Models and the Economic Assessment of TTIP. World Economy.

Optional Reading Material

- Shepherd, Ben (2017). The Gravity Model of International Trade: A User Guide

Afternoon: Application to experiments on trade policy

Topics

- Implementation of trade policy shocks: preferential trade agreements (PTAs) and other trade policy changes (Brexit)
- Political issues related to changes in NTMs

Compulsory Reading Material

- Burfisher (2011). Computable general equilibrium models. Exercises

THURSDAY, 1 JULY 2021

Morning: Application to experiments on Trade Policy

Topics

- Implementation of technical issues related to trade: reduction in international transport costs and trade facilitation mechanisms
- Interpretation of results for technical and policy-related trade shocks

Optional Reading Material

- Bekkers, E., J.F. Francois and H. Rojas-Romagosa (2018). "Melting Ice Caps and the Economic Impact of Opening the Northern Sea Route". *Economic Journal*, 128(610): 1095-1127.

Afternoon: Discussion of exercises, Handing out group exercise

Topics

- Discussion of policy exercises
- Work group: defining and implementing shocks

Further Optional Reading Material with recent applications of CGE Modelling

- Devarajan, Shantayanan, Delfin Go, Csilla Lakatos, Sherman Robinson and Karin Thierfelder (2018). Traders Dilemma. Developing Countries' Response to Trade Disputes. World Bank Policy Research Working Paper 8640.
- Dhingra, Swati, Hanwei Huang, Gianmarco Ottaviano, Joao Paulo Pessoa, Thomas Sampson and John Van Reenen (2017) The costs and benefits of leaving the EU: trade effects. *Economic Policy*: 651-705.
- Egger, Peter, Joseph Francois, Miriam Manchin and Douglas Nelson (2015). Non-Tariff Barriers, Integration and the Transatlantic Economy. *Economic Policy*: 539-584.
- Gouet, C, and D Laborde (2018) The crucial role of international trade in adaptation to climate change. NBER Working Paper 25221.
- Moore, Frances C., Uris Baldos, Thomas Hertel and Delavane Diaz (2017). New science of climate change impacts on agriculture implies higher social cost of carbon. *Nature Communications*.